PRIVATE TAPS, PUBLIC GOOD: EXPLORING COMPLIANCE, CONSERVATION, AND EQUITY IN UNITED STATES DRINKING WATER

A Dissertation

by

DAVID L. SWITZER

Submitted to the Office of Graduate and Professional Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Chair of Committee,	Manuel P. Teodoro
Committee Members,	Kenneth J. Meier
	Cary J. Nederman
	Ronald A. Kaiser
Head of Department,	William R. Clark

May 2017

Major Subject: Political Science

ABSTRACT

The privatization of drinking water utilities is a topic of increasing importance in the United States and abroad. In the United States, increasing populations, aging infrastructure, and the growing threat of climate change means public utilities face many important challenges in the coming years. In the current state of affairs, privatization is an attractive option for local governments. It allows them shift the management of their utility to a private firm while providing an infusion of revenue. While privatization is attractive, it is also controversial. Critics of privatization believe that it will lead to many negative outcomes. In this dissertation, I take the question of privatization seriously. Using a mix of normative and quantitative methods, I consider the implications of privatization for local democracy.

I begin my analysis by evaluating common criticisms of privatization. Many critics argue that privatization is contrary to a human right to water. I suggest that the human right to water only requires that states ensure all individuals receive access to a safe and affordable source of water, not that the source necessarily be public. Instead, the human right to water creates a strong duty for states to regulate private provision of drinking water. Similarly, I argue that critics' concerns about affordability, quality, and conservation are perhaps overstated when a strong regulatory state exists. I find that the arguments against privatization that hold the most weight are those that emphasize local democratic processes, since privatization in the regulatory state amounts to a centralization of political authority. I then turn to a series of statistical analyses focused

on utility responsiveness to local context. First, I examine the difference in private and public utility responsiveness in the context of drinking water compliance, finding that while private utilities outperform public in general, this is conditional on levels of citizen participation. Second, I investigate the adoption of water rates, finding that while private utilities are less likely to adopt conservation oriented policy in general, they are no less responsive to local context. My analysis suggests the importance of regulation, political context, and local government in drinking water policy.

ACKNOWLEDGEMENTS

I would like to begin by thanking Manny Teodoro for his mentorship and support. I did not know when I walked into his office in October of my second year that it would be one of the best decisions I would ever make. I honestly believe that I would not be receiving my Ph.D. if I had not done so. I can imagine he was very confused by a political theorist walking into his office asking about potentially working with him, but it has developed into an incredibly productive relationship that I expect will continue long after graduation.

I would also like to thank the rest of my dissertation committee for their mentorship. Cary Nederman helped recruit me to A&M, and has been a strong support for me throughout graduate school. The summer I spent discussing democratic theory with him was instrumental in my intellectual development, and his course on the philosophy of social science has helped shape the way I think about my own work. His baseball knowledge is also always appreciated. I also owe a great deal of gratitude to Ken Meier. When I decided that I potentially wanted to shift my focus from exclusively political theory to a more empirical public policy approach, it was Ken who assured me that it was possible. Ken was also instrumental in getting me involved with my work in the Bush School, which I am extremely grateful for. Ron Kaiser helped shape my interest in water policy early on. I took his course on water law the same semester I began working with Manny, and it played a large role in the way my interests have

evolved. I am fortunate to have a committee composed of such an excellent group of scholars and people.

My interaction with other faculty members at A&M has also been an important part of my development as a scholar and a person. When I first came to Texas A&M, I worked primarily with Lisa Ellis. While I was disappointed that we were not able to continue working together when she left the department, my work with her early in graduate school continues to shape the way I think about environmental politics. Paul Kellstedt, Dan Wood, Guy Whitten, and Ahmer Tarar all helped provide me with the methodological tools necessary for my work. This dissertation would not have been possible without their efforts.

Outside of the department of political science, the opportunity to work in the Institute for Science, Technology, and Public Policy in the Bush School has been incredible. My work in ISTPP was actually vital for the development of this dissertation. It was my work in ISTPP that sparked my interest in GIS, which featured heavily in the work leading up to the dissertation. Additionally, the people involved with ISTPP are excellent scholars and even better people. Arnie Vedlitz has been an incredible mentor and co-author to me. From our first meeting on, he has been an extremely strong supporter and advocate. I would also like to thank Kent Portney and Carol Goldsmith for their support. I would also share my gratitude with Justin Bullock, who has become one of my closest friends in Bryan-College Station since coming to Texas A&M.

I would not have been able to succeed in the Ph.D. program without the incredible support of my fellow graduate students. I must begin by acknowledging the

members of my cohort. I could not have asked for a better group of scholars and people to spend most of my graduate school journey with than Nathan Favero, Kendall Funk, and Andy Philips. Spending every day with a group of people that smart, hardworking, and supportive was truly special and something that I cannot imagine will be replicated at any point in my life. I would also like to acknowledge Rebekah Myers, who has remained one of my closest friends since we met during graduate school. Bradley Goodine was an amazing mentor to me, and was someone who greatly pushed me to pursue empirical work in addition to my normative work. His support and friendship has been immeasurable. I also express thanks to Mallory Compton for her friendship and encouragement. Nick Conway, Carla Flink, Grant Ferguson, Carlie Fogleman, Angel Molina, Abhi Ghosh Moulick, Liana Gonzalez, Brian Shreck, Seung-Ho An, Youlang Zhang, Mellie Haider, Soren Jordan, Clay Webb, Megan Dyer, and Guillaume Bogiaris all also deserve my gratitude. Outside of political science, I would like to thank Nicole Angeli. My conversations with Nicole in Lisa's environmental political theory course were a large reason why I decided to pursue environmental policy as an interest. More importantly, her friendship and support was vital to my survival of my early years in graduate school.

Finally, I would like to give thanks to the friends and family outside of academia who helped support me throughout graduate school. Ashley Burk and her dogs deserve specific thanks for keeping me sane while I wrote my dissertation. I have to give thanks to both of my parents. The support I received from both of them was crucial to my success in graduate school. My mom is the strongest woman I know, and I owe much of

my tenacity to her. My dad always taught me to be kind to myself and others. I do not think he expected me to work on a topic so close to what he does, but I am happy to declare that I am at least not an economist. My sisters also deserve special mention. Both Adele and Rebecca are such strong, kind, and intelligent people. Watching them both grow over these past five years has inspired me to strive to better myself. Their love and support means everything to me.

CONTRIBUTORS AND FUNDING SOURCES

Contributors

This work was supervised by a dissertation committee consisting of Professor Manuel P. Teodoro and Professors Kenneth J. Meier and Cary J. Nederman of the Department of Political Science and Professor Ronald A. Kaiser of Recreation, Parks, and Tourism Sciences.

All work for the dissertation was completed independently by the student.

Funding Sources

Graduate study was supported by an assistantship in the Department of Political Science.

TABLE OF CONTENTS

Page

LIST OF FIGURES

LIST OF TABLES

CHAPTER I

INTRODUCTION

The privatization of water utilities has received growing attention in recent years. Critics of privatization have often argued against privatization by casting it as an issue of human rights, commenting that since water is vital to life, turning it over to private control is unacceptable. Others have argued that the only appropriate strategy for the management of water is through democratic processes, since local democratic governance of water resources will lead to better outcomes and will embrace public participation. Despite the ample criticisms, political science has had little to say about the issue. No rigorous normative work has been done on privatization specifically, and very few empirical studies have looked at the differences between private and public utilities.

The major research goal of this dissertation is to understand the contexts in which private and public utilities are able to succeed, and understand when private or public management of water may be normatively desirable. How does the ownership of water utilities affect their ability to provide drinking water to their residents and protect human health? How do private and public utilities differentially respond to the demands of the citizens they serve? With the growing issues with aging water delivery infrastructure in the United States, and the problems local governments face in addressing the unfunded mandates placed on them by the Federal and State governments (Cimitile et al. 1997; Hanford and Sokolow 1987; Weiland 1998, Scheberle 2004), the implications of

possible further privatization of water utilities necessitates careful research. Much of the literature on the topic of privatization thus far has focused on the potential problems that could result from transferring control of drinking water to private ownership. Critics of privatization are concerned with the lack of public voice in decision-making, the potential for equity issues, and higher rates for water (Fauconnier 1999; Arnold 2005; Athlers 2010; Subramaniam and Williford 2012). Alternatively, some have argued that, theoretically, privately owned water utilities should outperform public utilities in terms of efficiency (Renzetti and Dupont 2003; Levin et al. 2002), but a number of studies have found that private utilities are not any more cost-effective than their public counterparts (Bel and Warner 2008a; Bel and Warner 2008b; Bel el al. 2010).

In this dissertation, I will address the privatization of water utilities in the United States normatively and empirically, exploring the contexts in which private and public utilities perform differently, with an emphasis on responsiveness to citizens. I will be addressing what is perhaps the most common critique of private utilities: that the sale of utilities to private corporations takes away "local control" from the citizens who are served by the utility. In this way, critics argue, the human right of citizens to safe and affordable drinking water are being violated and democratic control is being taken away. I will be looking at this question in two ways. First, I will be addressing the normative dimensions of utility privatization, questioning whether utility privatization is indeed a violation of the human right to water, and further exploring the content of the critiques levied on the basis of democracy. Second, and directly following from the normative exploration, I will examine the difference in responsiveness by public and private

utilities to citizens. If one of the major concerns with privatization is that it will make utilities less responsive to the democratic demands of the citizens being served, to what extent is that true? Do private utilities really respond less readily to citizens? And if so, what are the implications for the future of water utilities in the United States?

To this point, most of the work done on privatization has been published in law reviews and economics. With a few exceptions (Konisky and Teodoro 2016; Robinson 2013; Bakker 2010), empirical political science has not looked at the implications of the privatization of water utilities at all. Indeed, drinking water as a whole remains an understudied area of political science. There is little apparent reason for this oversight considering the robust role state and local governments have in the regulation and distribution of drinking water. Additionally, there has been little serious normative discussion of privatization, with most of the criticism coming from activists and journalists (Dilworth 2007). Although some discussion of privatization has taken place within the literature on water as a human right (Risse 2014; Williams 2007), a thorough normative discussion of the issue of privatization is lacking. Here I will investigate privatization from both a normative and empirical perspective, focusing on the role that public participation plays in the decision-making and performance of public and private utilities.

Methodological Approach

The dissertation will involve approaching utility privatization from both an empirical and a normative perspective. While the primary portion of the dissertation will be quantitative, I will also be applying tools from normative political theory as a means

of motivating the research and framing the implications of the results. While the advancement of social scientific theory is an important part of the dissertation, theoretical knowledge, practical knowledge, and normative considerations are not necessarily distinct concerns. Exploring how publicly and privately owned organizations differentially respond to the participation and needs of their citizens has important theoretical implications for both political science and public administration, the contributions of the dissertation are not limited to a social science contribution to the development of theory. Normative political theory can help us to understand why the empirical questions we ask are important, and can motivate what the implications are for public policy. This is especially poignant in the case of drinking water, where the public health is at stake. For that reason, this dissertation is an example of both applied/problem-driven normative theory and empirical social science, applying tools from both in conjunction in order to fully explore the question of utility privatization.

David Wiens (2015) has recently suggested that empirical social science has a great deal to add to normative theory, arguing that it is impossible to identify optimal political reforms until empirical constraints have been identified. It is only through rigorous social science that we understand what the limits are of political possibility. This argument is similar to that of Ian Shapiro (2016), who argues for an "adaptive political theory," where political theorizing should be empirically grounded in the actual world, rather than performed in abstract ways. A similar critique has been applied by Shapiro (2002) and Charles Taylor (1967) to empirical political science, who argue in slightly different ways for an empirical social science that recognizes the normative

content of empirical claims. Rather than ignoring the normative elements of politics in an attempt to vindicate scientific theory, these critics of theory driven social science argue that normatively aware empirical work is actually more rigorous. The broader methodological approach of this dissertation is to avoid normative theorizing without empirical grounding, and to avoid empirical social science that lacks normative grounding. A normative understanding of utility privatization without an empirical understanding of utility privatization is incomplete, as is the opposite.

I should note here that the arguments in this dissertation largely apply to developed countries, and the United States specifically. While water privatization is a major issue in the developing world, its implications are extremely different from the implications in the developed world. As will be seen, the existence of the regulatory state in the United States plays a crucial role in the arguments surrounding utility privatization. In countries that do not have the capacity for a robust regulatory state, many of the arguments have very different implications.

Regulation, Venues of Political Accountability, and Local Democracy

A few key themes emerge throughout the dissertation. First, I argue that regulation is critical to any argument for the acceptability of private utilities. Throughout the dissertation, I find that private utilities have incentives that lead them to perform similarly to public utilities in many cases, and in some cases actually outperform public utilities. My argument is that this is not due to the superiority of private management, or even the greater efficiency of privately owned utilities. Instead, I argue that it is because of the robust regulatory state in the United States that privatization does not seem to be a

large concern. Private utility rates are regulated at the state level by public utility commissions and the quality of the water is regulated by state and federal environmental agencies. The decision making and performance incentives facing private utilities are largely shaped by the agencies that regulate them. Both the normative and empirical analysis point firmly to the same conclusion: if privatization is acceptable (and I still argue that this is a large if), it must be accompanied by stringent regulation.

The importance of regulation is related to the second major theme that I would like to emphasize, which is that ownership is perhaps the wrong distinction to evaluate when exploring the differences between private and public utilities. Barry Bozeman (1987) argued that all organizations are public, suggesting that because all organizations are accountable to political authority, it is wrong to consider "publicness" as a binary phenomenon. Instead, he suggests that an organizations' relative "publicness" is determined by its accountability to political authority. I argue here that in the case of utilities, perhaps not even "publicness" is the correct element to consider. Since both public and private utilities are highly accountable in both rate setting and water quality to political authorities, what is of actual importance is the specific political venues to which private and public utilities are accountable. Essentially, I argue that privatization is a form of administrative centralization in the United States. Private utilities are primarily accountable to state level regulatory agencies, while public utilities are accountable to local governments. In this way, privatization really means a shift in the venue of political accountability from the city council chambers to the state capital. The difference in venues has important normative and empirical implications.

The final theme to emerge is the idea of local democracy. If, as I argue, privatization is a form of centralization, a primary concern of privatization critics still holds; privatization means a loss of local democratic control over drinking water resources. Even if we understand that privatization does not mean a lack of political accountability, but rather a shift in the venue of political accountability, it still means that it becomes more difficult for citizens to directly involve themselves in the political processes governing drinking water. Regulation may mean that private utilities are held accountable in the United States, but it does not change the fact that they are not as accountable to the localities they serve.

Overview of Chapters

Chapter II takes the normative questions inherent in utility privatization seriously. While many have criticized privatization using highly normative language, there has been little work focused on a serious evaluation of these claims. In this chapter, I evaluate the validity of these criticisms. I begin with one of the most common arguments against privatization, which is that to privatize water is contrary to the human right to water. Evaluating this claim requires answering three distinct questions. First, I ask whether a human right to water exists. Second, I ask what duties such a right would produce for states. Third, I ask what the implication of those duties are for privatization. I conclude that a human right to water does not mean a human right to the public delivery of water. Rather, it means that states have an obligation to regulate private utilities to ensure citizens receive access to safe and affordable water. I then move to claims about negative outcomes that may occur under privatization, concluding that

these claims are often overstated when a strong regulatory state exists. Finally, I explore the claim that privatization leads to a loss of local control by exploring the work of Alexis de Tocqueville and John Stuart Mill, arguing that it is in the loss of local democratic governance that privatization critics have the strongest claim.

Chapter III investigates the implications of privatization for drinking water quality, building on existing literature in public administration that notes the important differences between public and private organizations. I argue that while there are many reasons to expect that private utilities will outperform public in terms of water quality, the advantage of private utilities may be context dependent. Specifically, I argue that the greater connection between public utilities and the citizens they serve means that public utilities serving engaged citizens will respond with higher levels of performance. Testing my theoretical logic on Safe Drinking Water Act Compliance, I find that as election turnout increases, the regulatory gap between private and public utilities decreases. The difference eventually becomes statistically and substantively insignificant.

Chapter IV similarly explores the responsiveness of public and private utilities to citizens, investigating the effect of local conditions and citizen preferences on the adoption of increasing block rate pricing structures. Rate structures have important conservation and distributional implications, with increasing block rates generally considered more conservation oriented and progressive. Using measures of citizen partisanship, local moisture, and local inequality, I find that while public utilities are more likely in general to adopt increasing block rate pricing structures, there is little difference in the responsiveness to local conditions. Private and public utilities appear to

be equally responsive to climate and citizens, which is likely attributable to the role of public utility commissions.

I conclude in Chapter V. I explore the implications of my analysis for privatization, focusing on a number of themes. I then look into a few future directions for research and conclude with some thoughts on the future of privatization in the United States.

CHAPTER II

PRIVATIZATION, HUMAN RIGHTS, AND DEMOCRACY

As mentioned in the introduction, the privatization of drinking water utilities is a topic that has received a great deal of attention in recent year. Much of the literature on the topic of privatization has focused on the potential problems that might result from privatization. Critics of privatization are concerned with the lack of public voice in decision-making, the potential for equity issues, and higher rates for water. While concern over privatization is often framed as a normative concern, very little serious work has been done on the normative justifiability of utility privatization, and almost none has been done by political theorists, with much of the criticism coming from journalists and activists. This chapter attempts to rectify this by taking the question of privatization seriously. I should once again note here that I am addressing privatization primarily in the developed world, and specifically in the United States. As will be seen, regulation plays a large role in my arguments, and the arguments related to privatization are very different in nations that lack the capacity for stringent regulation. This chapter deals with some of the normative and conceptual issues with privatization.

I begin by looking at one of the most common arguments against privatization: that since access to drinking water is a human right, it is not acceptable to privatize water. I evaluate the content of this claim, concluding that if a human right to water exists, it only requires that states ensure private utilities provide safe affordable drinking water, and not that they prevent privatization all together. I then turn to the democratic

arguments against privatization, which may take two distinct forms. The first is that the lack of connection to local democratic processes will lead to worse outcomes for citizens. I evaluate three areas of concern, investigating pricing, health, and conservation. While there is some reason to be concerned about privatization in certain contexts, I suggest that regulation may mean that these concerns are perhaps overstated. Indeed, private utilities, under certain circumstances, may outperform public utilities on some of those dimensions. Importantly, I argue that it is perhaps not who owns the utilities that matters in the discussion of utility privatization, but rather the venue of political accountability. While public utilities in the United States are generally accountable to local governments, private utilities are accountable to state governments. In this way, privatization acts as a form of centralization. The second type of democratic argument follows directly from the understanding of privatization as centralization. These arguments focus on the lack of local democratic control under privatization. These are arguments about process rather than outcomes. Essentially, many critics of privatization are concerned that local voices in drinking water decision making processes will be lost. These arguments are perhaps most convincing. Following Alexis de Tocqueville and John Stuart Mill, I argue that the centralization of political accountability carries important implications for local government administration, and water privatization specifically.

Human Rights and Privatization

One of the most common arguments made by those who oppose the privatization of drinking water is that since drinking water is a human right, it is inappropriate to

commodify it or allow it to be controlled by private companies (Barlow and Clarke 2002). If something is as crucial to human life as water, the argument suggests, private interests should not control it. Indeed, nothing but oxygen is more essential to human survival than water, and as Mathias Risse (2014) points out, while oxygen is available freely available to all (although I would note not those who are currently under water), water has become more of a scarce resource, especially as human populations have expanded beyond their original locations along rivers.

It is the dependence of human life on water that make many uneasy with it being owned and provided by private firms. Many citizen movements, when confronted with privatization, suggest that the human right to water makes privatization unacceptable (Bakker 2010; Dilworth 2007; Barlow and Clarke 2002). This conclusion—that privatization of drinking water services is incompatible with access to potable water as a human right—involves a number of separate questions that should be addressed in turn. First, is access to drinking water indeed a human right? Second, if access to safe potable water is a human right, what obligations does that right create and for whom? Third, do those obligations preclude the privatization of drinking water?

The question of whether access to safe drinking water is a human right has been a greatly discussed topic in recent years. Philosophers and legal scholars have debated whether human rights exist at all, if economic and material rights are a part of them, and if drinking water is included in that category (Dinstein 1981; Cahill 2005; Hardberger 2005; Gleick 1999). Additionally, whether drinking water is a primary or subsidiary

right among a suite of rights protecting health and life has been a large part of this discussion.

One of the major reasons for this debate is that none of the primary United Nations conventions on human rights directly specify a human right to water (Bakker 2010). Bakker (2010) points out that while some countries have recognized a human right to water, others, such as Canada, have explicitly rejected such a right. Still, many scholars argue that such a right does exist, and that it is important to recognize it as an independent human right (Gleick 1999; Hardberger 2005; Cahill 2005). Hardberger (2005) argues that because early human rights declarations were written in general terms and did not explicitly state what was included in the right, such a right could be narrowly read and basic necessities such as water could be excluded. In fact, there are some who argue that a right to life is exclusively a civil right and does not include a right to avoid death from things like famine, starvation, or lack of medical care (Dinstein 1981). If the right to life is exclusively a civil right, then the right to water would not be included as a part of it. Most recent considerations of human rights, however, expand beyond this minimal definition of the human right to life, and consider the human right to life to apply to food, shelter, water, and other basic necessities required for survival (Hardberger 2005).

It may seem obvious that a human right to water exists at least within the broader human right to life, but many seek to establish an independent right to water as well. Hardberger (2005) argues that the specific importance of access to safe water makes it necessary to establish an independent human right to water. She argues that simply

recognizing the right to water as a subsidiary of the human right to life does not establish the recognition or enforcement necessary for those who lack access to water. Instead, she argues that by recognizing the independent right to water is a way to shine light on the issue, making it more likely that governments will be held accountable when they fail to provide the right. Importantly, she argues that recognition of the human right is crucial to the future of the movements towards sustainable development and environmental justice (Hardberger 2005).

While most of the work on the human right to water takes place within the large literature on legal approaches to human rights, especially as it exists within international law, Mathias Risse (2014) has taken up the question of a human right to water from a normative perspective, arguing that any acceptance of a human right to water requires a strong normative foundation. Risse, perhaps unexpectedly, uses the concept of the collective ownership of the Earth to underpin his idea of a human right to water. He relies on a Lockean interpretation of ownership of the earth, noting that Locke uses water as an example of mixing labor with land, and again as an example in the proviso (Risse 2014). Indeed, Locke specifically mentions drinking water, illustrating the idea of leaving "enough and as good" with the suggestion that "No body could think himself injured by the drinking of another man, though he took a good draught, who had a whole river of the same water left him to quench his thirst" (Locke 1988: 291).

Risse (2014) argues for a view of "Egalitarian Ownership" on the basis that the resources of the earth are required for human activity, that they have come into being without human causes, and that the satisfaction of human needs matters from a moral

perspective. Egalitarian ownership represents the view that all humans have a symmetrical claim to ownership of the original resources of the earth. Risse suggests a view of egalitarian ownership that while not endorsing equal ownership of all the world's resources, argues for a common ownership that ensures all individuals have equal opportunity to satisfy basic needs. Risse argues that this view of common ownership generates a set of rights, since no one may be denied the ability to use the earth's resources to satisfy their needs. Risse provides a more robust understanding of basic rights in light of the development of powerful states, arguing that in order to check the ability of states to abuse individual rights, individual liberties and political rights must be added as well.

Risse (2014) suggests that the human right to water comes out of the right to use the earth's resources to satisfy basic needs as well as the more robust understanding of a human right to political association. All humans, in Risse's argument, have a right to at least subsistence levels of life, and therefore a right to water at a subsistence level must be included in this bundle of rights. He goes further, however, arguing that the more robust understanding of human rights includes a claim to a right to enough safe drinking water to be an active member of society.

While there is more nuance to both Risse's arguments and the general discussion of the human right to water than can be elaborated here, it is not my primary goal to establish the human right to water, but rather to evaluate the normative implications of such a right for water privatization. While Risse's argument is not the only possible defense of a human right to water and can be questioned, it at least provides a defensible

and strong normative underpinning for the existence of an independent human right to water. It is not necessary to establish beyond doubt that a right to water exists to evaluate what its implications would be for privatization. Rather, since it is at least feasible to establish that a human right to water can exist, it must be asked: what duties does such a right impose?

At a minimum, a human right to water would suggest a negative duty for states, which would require that states not actively prevent citizens from accessing safe drinking water (Williams 2007). However, most who argue that a human right to water exists go further, and suggest that there exists a positive duty as well. States have a responsibility to ensure that all citizens have access to safe and affordable drinking water (Williams 2007; Risse 2014). Indeed, Risse (2014) and Harberger (2005) even argue that states have a responsibility to provide drinking water to citizens of other states if those rights are not being satisfied. It is also possible that it is not just states that have the responsibility to uphold human rights. According to Williams (2007), corporations may be bound by human rights as well, and this includes those that provide water.

So if we can establish that access to drinking water is indeed a human right, and that it creates duties for the state to protect and provide that right for its citizens (and potentially duties to protect that right for the citizens of other states as well), what does that mean for privatization? It seems clear that a human right to water does not require all water be delivered by public entities. Rather, it seems likely that such a right would require that the state ensure that all private suppliers of water are regulated in order to make certain that a safe and affordable supply of water for drinking and sanitation is

available to all. This does not mean a lack of privatization, but rather constraints on private providers of water. As Risse (2014:194) puts it, "a human right must constrain private markets to make sure everybody has access to enough safe water… But, although water occurs naturally, one might say, pipes do not." A human right to water only guarantees a right to water, not a right to the public provision of that water. Williams (2007), in investigating what an independent human right to water implies for privatization, concluded that because human rights say nothing about the delivery of the rights, there exists no contradiction between privatization and the human right to water. That human rights do not imply public delivery of those rights should not surprise us. If a human right to water exists, equivalent rights to food, shelter, and clothing are likely to exist as well. All of these are often provided by private entities as well through market exchanges. While states are required to ensure that all citizens are able to obtain them, states do not have to produce and supply them.

Indeed, if Williams (2007) is correct, and human rights do not only create obligations for states, but also for corporations, it is not even the state that would have to ensure that private utilities provide water, but the utilities themselves would have the same duties. Of course, the state would have to enforce regulations to make certain that corporations are meeting those rights. In general, it does not seem obvious that the human right to water and private control of water are incompatible. The human right to water does not imply no privatization at all, but rather suggests stringent state regulation to make sure private suppliers of water are providing safe and affordable water.

Local Democracy and Privatization

While it has been established at this point that recognizing a human right to drinking water does not necessarily preclude privatization, this is not the only critique leveled by those opposed to private control of drinking water. Another common argument is that the privatization of water utilities is yet another case of local democratic control being taken over by neoliberal forces and corporate capitalism (Robinson 2013). This argument suggests that it should be stakeholders, rather than shareholders, who control the natural resources in their area. By privatizing control of water, the bond between local democracy and natural resource management is severed.

But what is at the core of this argument? Do those who oppose privatization based on arguments for democratic control of natural resources make this argument because they value the local democratic process itself, or because they believe local citizen involvement in decision-making about drinking water resources will lead to superior outcomes? This question is crucial for our evaluation of utility privatization. As noted by Robert Goodin (1992), democracy has a tenuous relationship with environmentalism specifically because it can only guarantee processes, and not outcomes. Many theorists have attempted to bridge this gap, but the tenuous relationship remains (e.g. Saward 1996; Dobson 1996; Eckersley 1996). In the case of water utilities, both types of arguments have been made. Especially in the cases where citizen movements have opposed privatization, like those in Vancouver and Stockton, they have emphasized that privatizing would mean losing local governance. This argument seems to emphasize the process of local democracy, rather than any specific negative results

(Robinson 2013). Others seem to make the argument that we should be concerned about the negative outcomes they fear would result from the loss democratic governance (e.g. Food and Water Watch 2016). We should examine each of these claims independently.

Outcomes, Regulation, and Centralization

I would like to first evaluate the possibility that private ownership of utilities will lead to worse outcomes for citizens than public ownership. Essentially, such an argument would rely on the assumption that not only is there no tension between democracy and environmental outcomes, but that the accountability of public utilities to democratic government ensures better outcomes under public ownership. Privatization could result in three distinct outcomes that could occur from the loss of local democratic influence over drinking water resources. First, a lack of accountability could lead to higher water rates and less affordable pricing systems (Food and Water Watch 2016). Two, it is possible that because of the emphasis on profits over public health, private utilities will not provide safe drinking water to consumers (Food and Water Watch 2016; National Research Council 2002; Jacobs and Howe 2005; Barlow and Clarke 2002). Finally, again due to the lack of accountability, public water advocates argue that private utilities will emphasize profits over conservation (Howarth 1999; Bakker 2000, 2005). These possibilities deserve careful scrutiny. I argue that the nature of regulation may mean the danger posed by the lack of accountability for private utilities is perhaps overstated. Indeed, the incentives facing utilities under regulation may mean labeling privately owned utilities as fully private is not quite accurate.

Private utilities, at least in the United States, are not completely unaccountable to political processes. Rather, it is the political venue that influences decision making across sectors that changes when utilities are privately owned. While local government owned utilities are primarily accountable to the local governments that own and operate them, privately owned utilities are held accountable by state level regulatory agencies, which regulate water quality and affordability. The differences in venue of accountability may have major implications for the relative performance of private and public utilities, but does not necessarily mean that public utilities will always serve customers better than private. Indeed, in some cases it may be just the opposite.

First, with respect to affordability of water rates, it is almost certainly true that all else being equal, private utilities will charge higher rates for water than public utilities. Research has shown that private utilities charge significantly higher prices for water on average than their public counterparts (Food and Water Watch 2106; Levin et al. 2002). Indeed, it was opposition to the extreme rise in water rates caused by the sale of the water resources to a private corporation that led to the infamous "Water Wars" (Bakker 2010). A recent study in the United States examined the top 500 largest utilities in the country, finding that seven of the top ten highest water rates in the country belonged to private utilities, and that private utilities in the sample charged over 50% higher than public (Food and Water Watch 2016). Interestingly, the utility charging the highest rates in the study was Flint, Michigan. As will be discussed in the concluding chapter, Flint represents an interesting case of a public water utility where there was almost no political accountability at all. While the methods used in the analysis of water rates are

questionable, the findings reflect the long accepted idea that privatizing drinking water resources generally leads to higher water rates. Indeed, the results are very similar to a 1982 study done by the Congressional Budget Office, which found the private utilities charged between 30 and 80 higher than public for water.

Still, simply because private utilities charge higher rates on average does not mean they are unaccountable. Rather, it may be the specific venue of political accountability that leads to higher rates among private utilities than public. In the United States, public service commissions at the state level must approve all private utility rates. Water utilities operate as natural monopolies, meaning they face no market competition for service provision. Citizens do not have the choice about which water utility delivers potable water to their homes. In the case of natural monopolies, regulatory bodies are required to ensure that consumers are not charged excessive prices (Breyer 1982). Cost of service ratemaking of the kind that occurs at public utility commissions is indeed meant to keep prices affordable for citizens (Breyer 1982). The U.S. Supreme Court, in *Federal Power v. Hope Natural Gas*, ruled that the fixing of "just and reasonable" rates means a balance of consumer and investor interests. The need to balance consumer and investor interests means that while revenues are allowed to exceed operating expenses in order to "maintain… financial integrity, to attract capital, and to compensate its investors for the risks assumed," this may only necessitate a meager return. The presence of public utility commissions applying cost of service ratemaking means that private utilities are limited in their ability to charge excessive prices for water. Utilities are allowed a certain rate of return, but this is limited by the commissions. As will be discussed, the regulatory

incentives facing private utilities in rate setting also have implications for the quality of the water provided.

Even with regulation, private utilities do charge higher rates than public on average. The difference in rates is not so easily classified as "overcharging" from private utilities, however, but perhaps better characterized as "undercharging" by public utilities. In most cases, public utilities do not charge their customers full costs for water services (Levin et al. 2002). Instead, most utilities actually charge less for water than it costs to distribute the water to customers and maintain and update infrastructure. This difference in pricing is almost certainly due to the differing political incentives facing key decision makers in private and public utility rate setting. It is not the lack of political accountability that explains why private utilities charge more for water, but rather a difference in the venue of political accountability. Since rates are ultimately set by local politicians, they are more sensitive to what a raise in rates may mean for their electoral chances. Levin et al. (2002) put it best when they argue that it is the downward pressure of the ballot box on rates that leads to public utilities charging below cost. They suggest this is amplified by the fact that politicians have short terms and thus high discount rates (Levin et al. 2002). The incentives facing elected officials correspond with lowering rates in the short term even if it means less revenue for infrastructure maintenance and development in the long term. Raising rates can be an extremely controversial move, and risks elected officials' positions in government (Teodoro 2010a). Therefore, local politicians are incentivized to keep rates as low as possible, often leading to charging customers below cost.

The incentives facing private utilities are different when it comes to investment in infrastructure. The politics of public utility commissions are much less contentious than those of local government. Commissioners in most states are political appointees, and the political pressures are not nearly as great as those facing local politicians. While the politics of local government means public utilities are incentivized to keep rates below cost, the nature of cost of service ratemaking means private utilities are incentivized to reinvest in infrastructure maintenance and upgrades, since they can build reasonable expenditures into their rate structures (Averch and Johnson 1962). Public utility commissions will at least ensure that private utilities are able to make a reasonable profit determined by the rate of return multiplied by the rate base (Breyer 1982). In this way, private utilities are ensured of raising rates above cost. The difference in rate setting means that critics of private utilities are perhaps correct to point out that private utilities may charge higher rates for water than public, but they often ignore why this is the case, at least in the United States. Rather than private utilities raising rates to obscene levels because of a lack of democratic accountability, much of the difference in rates has to do with local governments undercharging relative to the costs of service. To be clear, the argument here is not specifically a normative one about whether utilities should be charging at, below, or above cost. There may be good normative reasons to say access to drinking water should be cheap or even free. Instead, it is simply to point out that the difference in rates between sectors has less to do with a lack of accountability and more to do with differing political venues and incentives. The presence of regulatory bodies are meant to keep private utility rates in check, incentivizing investment in

infrastructure, while the political incentives in local government encourage the lowering of rates below cost at the potential expense of investment in and upkeep of utility infrastructure.

The difference in rates and the specific undercharging by public utilities has major implications for the quality of drinking water provided to citizens. This is related to the second possible negative outcome of privatization, which is that private utilities, due to their emphasis on profits, will put the health and safety of citizens at risk. This argument would suggest that in focusing on profits, private utilities will adopt cost cutting measures that put the public health at risk. There is good reason to think that public utilities have great incentive to protect the public health of their citizens. If public utilities fail, managers and politicians can be held accountable at the ballot box, while private utilities are not accountable to local democratic politics. One of the great insights of the literature on environmental justice is that the potential for collective action is a large deterrent to environmental inequity (Konisky and Reenock 2013; Hird and Reese 1998). This potential for negative political backlash does not exist in the same way for private utilities, since they are not as beholden to local democratic action, as will be discussed in the next chapter. Once again, however, simply because public utilities are more accountable to local political authorities does not mean private utilities are necessarily going to fail in their provision of high quality drinking water.

As was the case in pricing, the lack of local accountability does not mean a lack of political accountability with regards water quality. In the United States, and in other developed countries, stringent regulations exist that require public and private utilities to

meet regulatory requirements with regards to the content and treatment of their water or risk sanctions, including fines and potentially criminal prosecution. The regulatory incentives facing private and public utilities may actually mean that private utilities have some advantages when it comes to the provisions of safe drinking water. Indeed, there is empirical evidence that private utilities do comply with regulations at higher rates than public (Davis 2005; Konisky and Teodoro 2016). First, as mentioned, the differences in rate setting mean that private utilities have a greater incentive to invest in infrastructure. Due to the downward pressure of voting, as well as the short term electoral incentives facing politicians, rates for public utilities are generally below cost. The electoral incentives mean that public utilities have fewer resources to invest in infrastructure upkeep and upgrades. In contrast, private utilities are able to factor expenditures on infrastructure into their pricing, incentivizing infrastructure upgrades to avoid regulatory sanctions. Keeping infrastructure up to industry standards is crucial for protecting the health and safety of citizens. The political pressures of local democratic governance may be beneficial from an affordability perspective, but these same pressures may potentially restrict the ability of public utilities to protect public health.

In addition to the difference in political accountability affecting the potential investment in infrastructure between sectors, the regulatory incentives from environmental regulators may also lead to private utilities being more likely to comply with drinking water regulations. This is the argument of Konisky and Teodoro (2016), who suggest that because public utilities have a greater ability to contest regulatory punishments, regulatory agencies are less likely to stringently sanction them compared

to their private counterparts. Additionally, while fines may have a large impact on the bottom line of private firms, governments cannot go out of business, meaning fines are less likely to influence the behavior of public utilities. According to Konisky and Teodoro (2016), given their lesser ability to contest regulation, and the greater impact of regulation on their bottom line, private utilities are incentivized to comply with regulations at higher rates. Testing their theory on the Safe Drinking Water Act in the United States, they find that private utilities do indeed comply with the SDWA at significantly higher rates than public.

Given Konisky and Teodoro's (2016) finding, it is clear that there is little reason to believe that public utilities will protect the safety of drinking water better than private utilities in all cases. In fact, their results suggests that private utilities in the United States actually comply with the regulations meant to protect the public health at higher rates than public utilities. We should be careful not to overstate the implications of this empirical finding, however. There is nothing inherent about private ownership that leads them to provide safe drinking water at higher rates than public utilities. Instead, the difference has to do with the incentives facing the different types of utilities, and specifically the regulatory incentives. It is because they face more stringent regulation with regards to enforcement as well as incentives to invest in infrastructure from the public utility commissions that can likely explain the differences between private and public ownership. Additionally, Konisky and Teodoro (2016) paint private and public utilities with a fairly broad brush. As will be seen in the next chapter, context greatly affects the incentives facing public utilities, and democratic participation may act as a

check on regulatory incentives, leading public utilities in areas with engaged citizens to perform better than those that serve less participatory communities. Regardless, it does seem that the fears of privatization critics over the health and safety of drinking water may perhaps be overstated.

The final outcome based potential criticism of privatization is that privatization may led to less focus on conservation. Once again, however, the lack of local democratic accountability enforcing conservation efforts does not mean a total lack of accountability. Public service commissions can require that private utilities consider conservation as a part of their rate structures. Public utilities, in most states, are not subject to public utility commissions, and so the decision to adopt conservation rates is left to the municipal government. The difference in political venues means that in certain cases, a utility may be more likely to adopt a conservation policy under private ownership than public.

A recent court case in California shows how this may be the case. In a 2016 lawsuit, the city of Claremont attempted to take by eminent domain the utility owned and operated by Golden State Water Company, which provided water to the citizens of Claremont. Golden State Water Company, at the instruction of the California Public Utilities Commission, had adopted an increasing block rate structure, meant to encourage the conservation of water by charging higher volume users. Evidently, the efforts had been successful, and the rate structure had led to a great deal of water conservation. If the city had been successful in the lawsuit, it would have transferred the management of the utility to the neighboring city of La Verne. The rates would have

been changed to a uniform rate, which charges all users the same per unit of water, regardless of consumption volume. In this way, the transfer of rate setting authority from the state regulatory agency to the local government actually would result in rates that would be less conservation oriented (City of Claremont vs. Golden State Water Company, 2016). While this is simply one case, it illustrates a broader point: There is nothing inherent about local government operation of utilities that ensures conservation. Once again, whether a private or public utility adopts conservation oriented policies or not is not necessarily a reflection of ownership alone, but rather the result of the differing political incentives facing each type of utility. Nothing ensures that public utility commissions will ultimately require private utilities to adopt conservation policies, but there is nothing inherent about local democratic processes that will lead to their adoption either. Indeed, under what conditions private and public utilities adopt conservation oriented rates will be discussed in Chapter IV. Privatization (under regulation) does not mean conservation will be ignored any more than local public control assures it will be considered.

At this point, a clear pattern has emerged in the investigation of the outcome based democratic claims against privatization. In fact, the implication is similar to the one concluding the discussion of human rights. It seems that the outcome based arguments against privatization do not hold in the presence of the regulatory state. Much like the human right to water only ensures the regulation of private providers of water, the outcome based arguments do not hold due to the existence of regulation. In fact, the idea that private utilities are unaccountable to democratic pressures seems to be wrong.

The existence of the regulatory state means that private utilities are indeed accountable to political processes and democratic governments. Bozeman (1987) has argued that all organizations are public since all organizations are accountable to some extent to political authority. Instead of focusing on a binary conception of public and private, he argues that we should instead consider the degree to which organizations are public or private, meaning the extent to which they are accountable to political or economic authorities. In the case of utilities, it is easy to understand that private utilities are quite "public" in this sense. Rate setting occurs within a political body, and private utilities are regulated by the state and federal governments with respect to water quality. While I do not wish to make the argument that public and private utilities are equally public in this sense, I would argue that at least in the United States, where a robust regulatory regime exists holding private utilities accountable to political authority, the difference in "publicness" between private utilities and public utilities is not necessarily the relevant distinction to consider. Rather, I would argue that the implication of this discussion is to focus not own ownership or the public/private difference, but rather on venues of political accountability. The different incentives provided by the differing political processes governing public and private utility behavior accounts for the differences.

In the case of public utilities, the venue of accountability is primarily the local government that owns and operates the utility. Ultimately, the local government decides the water rates adopted by the utility. Since state governments may struggle to sanction public utilities for regulatory non-compliance (Konisky and Teodoro 2016), it may be the responsiveness of local governments to citizens that encourages the delivery of

quality water, as will be discussed in Chapter III. In contrast, the relevant venue of political accountability for private utilities is in state regulatory agencies. It is in the public utility commissions that private utility rates are set and it is state environmental agencies that hold private utilities accountable for water quality. In this way, what privatization under the regulatory state means is not a turn to unaccountable drinking water services, but rather, in moving the relevant political venue from the city council chamber to the state capital, a centralization of political authority governing drinking water.

Privatization and the Loss of Local Control

This brings us to the final, and most common, argument levied by privatization critics, that privatization will lead to a loss of local democratic processes. This is not necessarily related to outcomes, but rather comes from a desire for local resources to be controlled by local governments. Robinson's (2013) description of the local protests against privatization in Stockton, California, emphasized that the citizen movement against privatization focused primarily on the loss of local democratic processes as their primary source of concern. The movement against the privately owned utility in Claremont used a similar frame. On their opposition website, Claremont FLOW (Friends of Locally Owned Water) argued that the purchasing of the water system from Golden State Water would lead to "local control," which would entail resident involvement in ratemaking, and local accountability in decision making, among other potential benefits. In both these cases, the opposition to privatization was not necessarily about outcomes,

but instead about process. Both movements wanted decision-making to happen at the local level.

The implication of the previous section actually makes this critique clear. I argued that the primary difference between public and private utilities is not their relative "publicness," but rather the venue of political authority that they operate in. Privatization does indeed mean some loss of local political control over drinking water resources. It does not mean a lack of political accountability or authority, but rather a shift in the venue of political accountability. Essentially, privatization leads to a centralization of political accountability for drinking water. It means the decision-making processes and responsibility shift out of the control of local governments and to public officials in the state government. We should take the normative implications of the centralization of drinking water accountability seriously. Indeed, political theory has had a lot to say about the importance of local democratic governance. With this in mind, I turn to the arguments of Alexis de Tocqueville and John Stuart Mill to understand what the implications are of privatization from a local democratic perspective. Both Tocqueville and Mill emphasize the importance of local democratic participation and governance. Their arguments may make clear what is at stake in centralizing political authority over drinking water through privatization and regulation.

Beginning with Tocqueville (1835), it is clear that he views local democratic governance as an almost universal good. He understands local municipal institutions to indeed be necessary for the liberty of citizens, arguing that "town meetings are to liberty what primary schools are to science" (2). In lieu of local independent government,

Tocqueville suggests that free government may be possible, but sooner or later it will devolve into despotism. It is participation in local government that prepares citizens for liberty.

In his investigation of local governments in the United States, Tocqueville recognized in the American political system an argument that it is local government that should control that which concerns primarily themselves. He suggests "that in the United States the county and the township are always based upon the same principle: namely, that everyone is the best judge of what concerns himself alone… the township and the county are therefore bound to take care of their special interests" (13). While this is a descriptive claim and not necessarily a normative one, Tocqueville views the implications of this local control as largely positive. He argues that the decentralization of administration in the United States has important positive effects on democratic character of the nation. It is in part the freedom of the local governments in the United States that keeps it from slipping into tyranny.

Tocqueville is highly concerned with the implications of centralization on the democratic character of a country and its people. Importantly, however, Tocqueville makes a crucial distinction between centralized *government* and centralized *administration*. Tocqueville argues that government centralization occurs when the laws related to the interests of the nation as a whole, such as foreign policy, are concentrated in a centralized political body. In contrast, when control over interests related to localities are concentrated in a centralized political body, this would be considered centralized administration. Tocqueville believes that the difference between the two

types of centralization is of critical importance. While Tocqueville argues no nation can prosper without a great deal of government centralization, he claims that administrative centralization is destructive to the long term success of a democratic nation. Tocqueville suggests that administrative centralization may be useful for achieving short terms successes, but it will inevitably diminish the local spirit.

At the time of his writing, Tocqueville (1835) suggested that while the centralization of government in the United States was complete, there existed no centralized administration at all. Tocqueville grants that it may be the case that a centralized administration may be able to administer public services better than local administration when the local authorities are unqualified and ignorant and centralized authorities are enlightened. But he argues that when citizens are enlightened and take an interest in their affairs, the best governance is to be found in a decentralized system. He states that no matter how "enlightened and skillful a central power may be, it cannot of itself embrace all the details of the life of a great nation" (16).

Importantly, Tocqueville (1835) argues that a centralized administration leads to uniformity. Essentially, he suggests that centralization allows society to maintain a status quo, with little room for either decline or improvement. In this way, Tocqueville suggests that centralization is good for prevention, but not for action. He argues that centralization leads to a "drowsy regularity in the conduct of affairs which the heads of the administration are wont to call good order and public tranquility. (16)"

Tocqueville's (1835) strongest stand against the centralization of administration has to do with its effect on the character of a people. Indeed, Tocqueville goes so far as

to argue that even if a centralized administration would indeed do a better job of governing than a decentralized one, he would still prefer the decentralized one. He suggests that even if a centralized system of government would lead to more security and better management of societal resources, the political benefits of decentralized administration would be greater. Tocqueville states that under a powerful centralized authority, the political character of men disappears, and they find themselves disinterested in public affairs, since their security is provided without any action. Tocqueville characterizes the type of citizens that are developed under such a centralized authority in very stark terms:

> This want of interest in his own affairs goes so far that if his own safety or that of his children is at last endangered, instead of trying to avert the peril, he will fold his arms and wait till the whole nation comes to his aid. This man who has so completely sacrificed his own free will does not, more than any other person, love obedience; he cowers, it is true, before the pettiest office, but he braves the law with the spirit of a conquered foe as soon as its superior force is withdrawn; he perpetually oscillates between servitude and license (1835: 19).

Indeed, this is the crucial point for Tocqueville: when men cease to be involved in the administration governing their lives, they cease to be prepared for liberty. In Tocqueville's understanding, it is local democratic governance that shapes the characters of citizens in a democracy and ultimately allows the democracy to function.

So it is clear that for Tocqueville, decentralized government administration is important, and local government control is crucial to democracy. What is the relevance of this argument to the privatization of water utilities? As mentioned, privatization is really a form of centralization, and to put it in Tocqueville's terminology, it is a form of administrative centralization. When utilities are privatized, authority for governing drinking water shifts from the local government to the states. Clearly, taking Tocqueville seriously would make us concerned about privatization for a number of reasons.

Let us first consider Tocqueville's suggestion that enlightened local administration is superior to a centralized administration. While it is difficult to define what a "superior" administration looks like in general, when it comes to the distribution of drinking water to citizens this almost certainly means that the water is at least safe for consumption. In this case, then, Tocqueville's argument would at the very least mean that a public utility serving an engaged citizenry would do a better job of protecting the public health than a private utility regulated by the state. This is an empirical question, not a normative one. Konisky and Teodoro (2016) provide good evidence that private utilities outperform public, in part due to the regulatory state. Once again, however, they do not consider that this difference may be conditional. Indeed, Tocqueville's assertion about the difference between centralized and decentralized government administration is itself conditional. He suggests that decentralized government will be superior conditional on the engagement of citizens. Chapter III will take up this question in further detail, but Tocqueville's primary point is important. Centralization may lead to better outcomes

when local citizens are not engaged in politics, but when norms of civic engagement are strong, decentralization is preferable.

More important, however, is his discussion of the influence of centralized administration on democratic character. I believe it would perhaps be too strong to state that the privatization of water utilities in the United States, and therefore the centralization of political authority governing drinking water resources, would ultimately lead to the end of a love for liberty among citizens, but I would argue that Tocqueville's discussion gives us reason to be skeptical of moving control of drinking water resources to the state capital. Water is an essential public good. Privatization, and the resultant centralization, means that citizens no longer have direct local access to the decision makers governing drinking water. If citizens aren't able to engage locally about something as fundamental as drinking water, it is difficult to know what issues they are meant to engage in. Drinking water policy impacts citizens' lives on a daily basis. Many of the challenges facing the future of water utilities will require public attention and citizen interaction. Following Tocqueville, I would argue that it is reasonable to consider whether privatization will problematize the future of democratic citizens with interests in water issues.

Additionally, I think it is reasonable to consider what Tocqueville's arguments mean for the endurance of the institutions governing water in the United States. Under regulatory bodies, as currently constituted, there is little reason to be concerned about privatization in the short term. Public utility commissions and state environmental agencies seem to do a reasonable job at holding private utilities accountable. The

question is whether these institutions are durable in the long term when compared to local administration of drinking water. One of the major concerns of ClaremontFLOW is not just local control of drinking water now, but also in the future (ClaremontFLOW 2017). Tocqueville argues that local administration is more enduring; it is possible that public utility ownership is as well.

John Stuart Mill, in *Consideration on Representative Government*, also discusses the role of local government in democratic society. Mill (1991) views the role of local governments as indispensable, arguing that given the great number of responsibilities of government, it is necessary for a division of labor between the centralized government and the localities. Mill took up the question of local government with two separate goals. He first sought to understand how local governance can be best administered. Second, he was concerned with the educative aspect of local government.

Beginning first with the question of government administration, Mill (1991) argues that all business that is purely local should be given to the local authorities. He includes in this list "paving, lighting, and cleansing of the streets of a town, and… the draining of its houses" (299). He recognizes, however, that it may be the case that local government officials, and the citizens responsible for holding them accountable, may be inferior in some qualifications to those in a centralized authority. Mill suggests that centralized governments are usually of much greater intelligence and general knowledge than those at the local level and that more attention is paid to the actions of higher level government officials. He argues, however, that even given the probable inferiority in knowledge of local officials and the lesser knowledge of the citizens responsible for

watching them, this gap in competence is made up for in the interest in local affairs by the local administrators.

Importantly, for Mill (1991), this greater interest in local affairs is largely due to the influence of public opinion on local administration. He argues that local opinion will sway local administrators to a far greater extent. Since they are residents of the area, and since their authority rests on the consent of the local public, they are likely to take a greater interest in the affairs of their locality. Mill makes this argument with analogy to individuals caring about their own affairs. Mill suggests that while someone's neighbors may be far more intelligent than him, and even care about his welfare, "his own interests will be better attended to in his own keeping than in theirs" (302). Mill is essentially arguing that since local administrators are among the people affected by their decisions and beholden to those affected by their decisions, they will ultimately be a better caretaker of local affairs than a centralized government.

There are two important points to be considered in this claim. The first is responsiveness. Mill seems to suggest that because of their proximity, local administrators will be more responsive to local public opinion and constituent concerns. The idea that local government will be more responsive than centralized government will be a constant theme throughout this dissertation, and will be addressed in greater detail in Chapters III and IV. Second, Mill also suggests that local governments will have more knowledge about local affairs than the centralized government. While Mill argues that centralized governments will have more knowledge and expertise about

political issues in general, it is local governments whose knowledge is best suited to the management of local concerns.

Importantly, however, Mill (1991) does not believe that local administration should occur without oversight. Indeed, he argues that while it is ultimately up to the local governments to administer those affairs that are local, the centralized government should play an important role in supplying knowledge and expertise to the local governments. He states that "Power may be localized, but knowledge, to be most useful, must be centralized" (304).

While Mill devotes a great deal of attention to the functioning of local government, like Tocqueville, he also believes that local government is crucial for the civic education of the people. Mill adamantly argues that the political education of the people is of extremely high importance, and argues that local government is actually the "chief instrument" for the development of the public spirit. Interestingly, for Mill, much of the educative element is in actual participation as members of local government administration. He suggests that the opportunity to serve in local government allows individuals who would not normally involve themselves in public affairs to learn how to act for the public interest.

The implications of Mill's ideas of local government for water privatization are similar to Tocqueville's, but with some important distinctions. Certainly, the educative element of local government participation is important for both scholars. Although Tocqueville seems to be describing something more abstract in his discussion of the role of local government in educating citizens, while Mill focuses more on the actual

involvement as public officials, the implication is similar. If it is not in local government that citizens are to care about their affairs, and water specifically, it is difficult to imagine where they will gain knowledge.

Perhaps more interesting are some of the different emphases in Mill's writing on local government. Perhaps the most important point raised by Mill that is not addressed by Tocqueville is the responsiveness of local governments. Mill strongly suggests that local governments will be more responsive to citizens than centralized governments, largely due to the close proximity between government actors and their constituents. This is a crucial part of the claims against water privatization. Privatization critics greatly value government responsiveness and self-determination. They feel as though citizen voices have a better chance of reaching local governments than private companies (regulated by centralized governments). Mill's arguments about the responsiveness of local administrators to citizen opinions fit this argument well. Relatedly, Mill argues that local governments should have more knowledge about local conditions than centralized governments, and therefore are best suited to the particulars of local government. If this is the case with respect to water utilities, then it is local governments who may be best suited to adapt local policy to fit the needs of the locality. It should be noted, however, that the responsiveness of local government to citizens and the superior fitness of local governments to adapt to local conditions are also empirical questions. Indeed, Chapters III and IV will largely address these questions as they relate to utilities.

While exploring the implications of Mill and Tocqueville for utility privatization has yielded some interesting insights and possibilities, the major reason for exploring their work is to understand the stakes of centralization through privatization. Privatization may not necessarily lead to poor outcomes for citizens. In fact, in many cases, it is likely that private utilities will outperform public, especially when it comes to the safety of drinking water. There are few direct outcome based reasons for preferring public utilities to private. With this in mind, we should still be careful in considering privatization. Tocqueville and Mill make clear the stakes of centralized governance, and considering the nature of the regulatory state, this is what privatization amounts to. Even if privatization is better from a public health perspective, if we value democratic governance, we should be wary of sacrificing self-government for safety.

Conclusion

Drinking water issues can result from either public or private ownership. Governance failures do not discriminate by ownership. Indeed, many of the concerns of privatization critics seem to be arguments for stringent regulation, rather than arguments that necessarily conclude with local control over all drinking water resources. Human rights arguments do not mean privatization is unacceptable. Indeed, if a human right to water exists, it appears to only imply that states must regulate drinking water, not that the government be the sole provider of it. A human right to water only creates a duty for public regulation of drinking water, not a duty for states to supply drinking water. Similarly, many of the criticisms about price, quality, and conservation seem to be overstated. In the presence of the regulatory state, there is no reason to expect that

privatization will necessarily lead to worse outcomes. Indeed, I have argued here that in the United States, where regulation is robust, the true distinction to make is not of ownership, or even relative levels of "publicness." Rather, it is important to understand how differences in venues of political accountability incentive the behavior and decision making of utilities. Importantly, in the presence of regulation, privatization does not mean a shift from political accountability over drinking water to no accountability over drinking water, but rather a shift towards centralized oversight of drinking water resources.

This centralization, however, fits well with what many critics of privatization stress, which is that privatizing may mean giving up local control of drinking water. Indeed, privatization really means a move from the city council chambers to the state capital in terms of who is responsible for drinking water governance. In this sense, there is good reason to be concerned about privatization. Following Tocqueville and Mill, I have argued that centralization carries some concerning implications. Privatizing would mean sacrificing the participatory elements of local democratic life emphasized by Mill and Tocqueville. Where public governance fails, private ownership may seem to be a desirable alternative. The costs to local democracy of privatization should not be taken lightly, however. It does not seem obvious that the privatization is as great a risk to the physical well-being of citizens in developed countries as its critics suggest. We must be careful, however, that it does not pose too big a risk to their role as citizens.

CHAPTER III

PRIVATIZATION AND REGULATORY COMPLIANCE: PARTICIPATION AND RESPONSIVENESS

Having addressed some of the normative and conceptual arguments surrounding privatization, it is now important to move to a discussion of the empirical implications of utility privatization from a democratic perspective. In this chapter, I investigate the relationship between local citizen participation, ownership, and regulatory compliance, specifically looking at utility performance under the Safe Drinking Water Act (SDWA). One of the major critiques of private utilities, as mentioned in the previous chapter, is that they will not adequately protect the public health (National Research Council 2002, Jacobs and Howe 2005). At least in the case of the United States, however, this does not appear to be the case. Konisky and Teodoro (2016), in their investigation of private and public utility compliance with the SDWA, found that private utilities comply with the SDWA at far higher rates than public utilities. I argue here that the different political pressures and incentives facing public and private utilities, again due to the differences in venues of political accountability, mean that the relative performance of public and private utilities will be depend on the level of citizen engagement in the communities they serve.

I turn to the literature in public administration to show how this conditional relationship between ownership and participation may be true. How sector ownership impacts the decision-making and performance of organizations has long been a central

topic in the public administration literature. An enduring theoretical insight from this literature is that public organizations, due to their connection to political processes, should be more responsive to external stakeholders, including citizens, than private organizations (Rainey et al. 1976). This literature is particularly relevant in the case of utilities, since one of the biggest concerns of anti-privatization critics is that private utilities will be less responsive to the citizens they serve. This is a testable proposition. In this chapter, I advance a theoretical argument that looks at the role that citizen participation plays in public and private organization performance. Where citizens are not politically engaged, I argue that private organizations will outperform public. Where citizens are engaged, however, I suggest that the political costs of poor provision of public goods will be higher for public organizations, and the performance differences between ownership types will not be as large. As will be discussed, this is once again related to venues of political accountability, rather than ownership directly. It is because of greater accountability to regulatory agencies at the state level that private utilities may be expected to outperform public utilities in general, while it is the local accountability facing public organizations that mean the performance gap between sectors may shrink as citizen engagement increases.

In this chapter, I make arguments that have implications not only for the privatization of utilities, but for public administration discussions of private provision of public services more generally. While the specific goal of the dissertation and this chapter is to investigate ownership and political incentives in utility policy, I believe that many of the arguments are generalizable and apply to the public administration literature

more broadly. The possibility of citizen participation greatly influencing the performance of public organizations, while private are relatively unaffected, has major implications for not just the utility industry, but also education, healthcare, and any other service that can be provided by the different sectors.

The chapter begins with a brief discussion of the public administration literature on the differences between public and private organization, with an emphasis on the difference in responsiveness to external actors, and specifically citizens. I then turn to a discussion of the literature on citizen participation and organization performance, which has generally shown that increased citizen participation, whether it is directly in the policy process or in a more general civic participation sense, leads to improved performance from government. I follow this with a discussion of the implications for the water utility industry specifically. I then advance a new theoretical argument about the role that citizen participation may play in the relative performance of public and private organizations. Out of this theoretical discussion, I generate two hypotheses about the relationship between political participation and ownership. First, I propose that participation will have a greater effect on performance for public organizations than private. Relatedly, I hypothesize that the gap in performance between public and private organizations will decrease as participation increases. Testing these hypotheses by examining private and public utility compliance with the Safe Drinking Water Act, I find that while private utilities indeed comply with regulations at a higher rate overall, this performance gap is conditional on voting turnout. Voting turnout has a strong negative effect on the number of violations committed by public utilities, but does not have a

significant effect on private utility performance. Where turnout is low, the regulatory gap is extremely high, with public utilities committing far more violations than private. As voting turnout increases, however, the gap decreases, essentially becoming non-existent at high levels of voting turnout. I conclude with some implications of the results and directions for future inquiry.

Organizational Sector and Citizen Influence

The literature in public administration has long addressed the major differences between the public and private organizations responsible for the provision of public services. One of the enduring questions in public administration is how ownership influences organizational management and performance. A significant body of literature addresses the differences in how public agencies and private firms provide public services (Meier and O'Toole 2011; Rainey and Bozeman 2000; Rainey et al. 1976). While the literature has noted a significant number of differences between the private and public sectors, including employee attitudes (Houston 2000; Bullock et al. 2015), organizational structure (Rainey et al. 1995), and administrative procedures (Lan and Rainey 1992; Rainey et al. 1995), one of the major theoretical differences between public and private organizations relates to the influence of external stakeholders (Rainey et al. 1976). Because of their connection with political processes and elected officials, public agencies should be far more responsive to external stakeholders, and especially responsive to citizen demands (Wilson 1989). The differing incentives faced by public and private organizations suggest that public agencies should be more responsive to external influences than private firms (Boyne 2002). While private firms are supposed to

answer primarily to shareholders, public agencies face multiple institutional incentives, and are subject to multiple political principals (Dixit 1997; Rainey et al. 1976; Wilson 1989). Most crucially for the purposes of this analysis, that public agencies are influenced by popular elections and political appointments means that the meeting the interests of citizens and "public opinion" is far more important for the decision-making of public agencies (Rainey et al. 1976). Indeed, it is fundamentally because of the connection between public agencies and political processes that they should be more responsive to citizen demands than private firms.

In what few empirical tests have been done on the difference in sector responsiveness to external stakeholders, however, the results have been mixed. Lachman's (1985) study of CEOs in Israel found that public and private did not perceive external influences in different ways, although the survey did not include questions dealing with political participation. Baldwin (1990) found that public agencies in Atlanta experienced more pressure from external influence than did private agencies. Similarly, Coursey and Bozeman's (1990) analysis of private and public managers in Syracuse found that the decisions of public organizations experienced greater participation from outside of the organization. Despite the relatively sparse empirical testing of this theoretical idea, the logic remains sound. Due to the connection between public agencies and political processes, external stakeholders, including citizens, should have more influence on public organizations than private.

Citizen Participation and Performance Outcomes

Given the emphasis in public administration on organizational responsiveness to citizens (Roberts 2004; Kathi and Cooper 2005; Vigoda 2002; Feldman et al. 2007), the possibility that private organizations may be less responsive to citizen concerns is important. Still, while many have advocated for increased citizen participation and organizational responsiveness, few public administration scholars have tested the possibility. In a recent study seeking to rectify this gap, Neshkova and Guo (2011), found that citizen participation in the department of transportation indeed led to greater organizational performance.

While the public administration literature has done little empirical testing of the role that citizen participation plays in organizational performance, the literature on environmental policy has devoted some attention to the topic. In an overview of the effect of citizen advisory committees on environmental decision-making, Chess and Purcell (1999) found that while the effect of participation varied depending on the specific situation, public participation has a large role to play in environmental decisions and outcomes. Recently, in investigating environmental justice concerns in the implementation of the Clean Air Act, Konisky and Reenock (2013) found that community mobilization could potentially mitigate problems that can result in the inequitable distribution of environmental implementation. They found that while minority communities were generally subject to more severe violations of the Clean Air Act by local polluters and less stringent enforcement by regulatory officers, when the communities were mobilized, at least in the case of black communities, this bias was

mitigated. Similarly, Daley (2007) found a robust role for participation in environmental decision-making with regard to the implementation of Superfund. In her analysis of EPA remedy selections, Daley found that the presence of community groups in the policy process increased the level of clean up by the EPA. When groups representing the communities affected by Superfund sites were able to represent their own interests to the EPA, the agency was far more likely to implement more stringent cleanup plans than in communities that did not have active citizen groups (Daley 2007).

Understanding the role that citizens play in the performance of government is not a new question. In a number of studies exploring successful governance in Italy, Robert Putnam and co-authors explored the role that citizen participation played in the performance of government. Essentially, Putnam et al. (1983, 1988) argue that successful institutional performance will be dependent on the level of citizen engagement. They argue that successful self-governance through political institutions will depend on the "political culture" of the citizenry. Where citizens are active participants who pay attention to political concerns within their community, government performance should be high. Where citizens are less engaged, however, government performance will suffer. Indeed, in exploring this possibility in their investigation of Italian government performance, Putnam et al. (1983, 1988) found that the level of citizen engagement was a strong and significant predictor of institutional performance.

In general, the literature seems to suggest that increased citizen participation in organizational processes and increased citizen engagement more generally increase the performance of government. While some studies have focused on direct citizen

participation in these processes and others have focused on the levels of public engagement as a whole, the general finding remains the same: increased citizen engagement is beneficial for government agency performance. Considering this set of findings, the difference between public and private organization responsiveness to citizens is of great importance.

Implications for Drinking Water

The privatization of drinking water utilities provides an especially important empirical subject for exploring the difference in private and public responsiveness to citizens. The privatization of water utilities in the United States and beyond has received a great deal of attention across many disciplines in recent years. Much of the literature on the topic has focused on the potential problems that could result from privatization. Critics of privatization are concerned with the lack of public voice in decision-making, the potential for equity issues, and higher rates for water (Fauconnier 1999; Arnold 2005; Athlers 2010; Subramaniam and Williford 2012).

Despite the concerns over utility privatization, some have argued that privately owned water utilities should outperform public utilities in terms of efficiency (Renzetti and Dupont 2003; Levin et al. 2002). While privatization in other areas is thought to be more efficient because of the social gains that result from increased competition, this argument does not apply to the privatization of water. Water utilities are natural monopolies, meaning that any increases in efficiency from privatization will not be the result of direct market competition (Levin et al. 2002). Where private utilities do have an advantage over public is in their ability to raise rates for investment. Levin et al. (2002:

45) put it best in suggesting "that the rate payers are also voters provides a constant downward pressure on rates." Because public utilities are held accountable through elections and appointments by political principals, they will seek to avoid the unpopular decision of raising rates. Since private utilities must only face relatively insular state utility commissions and do not face electoral repercussions, they are generally able to set their rates much higher than their public counterparts (Levin et al. 2002). This advantage in the ability to raise rates provides more capital for investments in infrastructure, and theoretically a better product. Once again, I should note, the differences in expectations for public and private utilities with regards to ability to raise rates has less to do with ownership and more to do with venues of political accountability. Private utility rates are kept in check by public utility commissions, but they are assured a reasonable rate of return. In contrast, public utilities, facing different political incentives as parts of the local government, are incentivized to keep rates as low as possible.

Two of the major concerns of the anti-privatization critics are relevant here. First, many critics believe that because private utilities are primarily concerned with maximizing profits, they have little incentive to protect public health (National Research Council 2002, Jacobs and Howe 2005). A few studies have investigated this possibility by looking at private and public utility compliance with the SDWA. Wallsten and Kosec (2008) and Konisky and Teodoro (2016) have both looked at differences between private and public compliance with the SDWA. While Wallsten and Kosec (2008) find that there is little difference between private and public compliance with the monitoring and health requirements of the SDWA, Konisky and Teodoro (2016) find that private utilities

generally outperform their public counterparts. Konisky and Teodoro (2016) suggest that the superior compliance records of private utilities are partly related to the fact that while public agencies must secure resources through costly political processes, private firms are able to push the costs of compliance onto their customers. This logic is related to the second major criticism levied by privatization critics, which is that public utilities are more responsive to the public than private, and that privatization will lead to less citizen influence on utility matters. In this way, they argue that privatization subverts local democratic control.

If Konisky and Teodoro are correct, then it appears that there is a significant tension between these two critiques. One of the main reasons why private utilities are able to comply with the SDWA at higher rates is because they are not subject to the same political pressures as public when it comes to obtaining the resources necessary for compliance. What Konisky and Teodoro may underestimate, however, is the possibility that accountability to citizens may actually increase the costs of poor performance for public utilities in certain circumstances. By addressing the role that political participation may play in the performance of public utilities, it is possible to gain a fuller understanding of the relationship between privatization, political accountability, and democracy.

Participation and the Logic of Government Performance

In order to understand how private and public utility performance may differentially depend on citizen engagement, we must first understand the different incentives facing the two types of organizations. As will be outlined below, there are a

number of good reasons to expect private organizations to outperform public in providing services to citizens. I argue, however, that the relative performance of private agencies and public organizations will depend on the level of citizen engagement.

We should first consider the costs of supplying a public service. Public and private organizations may reasonably be expected to face similar costs when it comes to the direct capital and operating costs in the provision of services. Although there may be some amount of variation across organizations and contexts, it is reasonable to assume that the costs of the employees, technology, and resources required for service provision should be roughly equivalent across sectors. This is certainly true in the water industry, where treatment technologies, staffing, and other delivery costs are broadly similar across sectors. It is in the indirect costs of public service provision that public organizations may face disadvantages. As discussed earlier with respect to water rates, public agencies often face great difficulties in obtaining the resources necessary for quality performance. While private firms can simply pass costs on to customers, public agencies need to go through difficult political processes in order to obtain the revenues necessary to adequately provide services. The downward pressure of the ballot box means that raising revenues will be more difficult for public agencies than private firms. While the operational and capital costs can reasonably be assumed to be the same independent of ownership, the greater difficulty in obtaining funds for operation means that costs should generally be higher for public agencies than private firms. This difference in ability to obtain funding is reflected in the fact that many public utilities actually charge below cost for potable water delivery (Levin et al. 2002). As discussed,

while activists have criticized private utilities for charging significantly higher rates for water (Food and Water Watch 2016), the difference is often due to the fact that political pressures make it difficult for public utilities to raise rates, rather than private utilities attempting to overcharge. Again, due to the differences in areas of political accountability, the cost of quality service provision should be higher for public utilities than for private.

In addition to facing lower costs in obtaining the resources necessary for quality public service provision, private firms also face potentially greater costs for inadequate performance. Because they are operating in a market, poor performance can be costly for private firms. Market incentives mean that when private organizations perform poorly their bottom line will suffer. When public organizations perform poorly, however, they may not face the same kind of costs. Indeed, Lindsay (1976), in his theoretical investigation of the difference between public and private service provision, noted that because private organizations are primarily accountable to the market, they will be more likely to adjust to customer concerns about performance. Public organizations, facing multiple incentives and sources of information, may not align their performance as closely with consumer demands (Lindsay 1976). It is because of the greater market incentives faced by private firms that Lindsay expects them to outperform public agencies.

It should be noted that in the empirical subject to be examined here, the performance of water utilities, market competition does not exist in the traditional sense. As mentioned earlier, utilities operate as natural monopolies, meaning most customers

do not have a choice over who provides their potable water. In this case, it would seem that market competition would not increase the cost of poor performance for private utilities. The market does exert pressures on performance in other ways, however. The best way for private utility companies to grow their market share, and therefore profits, is by purchasing new utilities from local governments. Private utilities with records of poor service provision will be less competitive in the market for new utility acquisitions. In this way, there are market costs for private utilities with poor performance, just not in the traditional sense we understand them. In this way, Lindsay's (1976) logic still applies since private utilities still face a form of market competition. Through the market for purchasing new utilities, private firms will face costs and gain information about performance in a different way than public utilities.

In many situations, there is an additional cost that can be considered. In many policy areas, including drinking water provision, regulatory requirements exist to make sure certain standards are being met in terms of service provision. While these regulations are usually meant to guard against potential market failures that may occur in private enterprise, they often apply equally to both private firms and public agencies. The application of regulations to private and public organizations is the case with regards to environmental regulation in the United States, where local governments are subject to many of the same regulations as private organizations. In cases where organization performance is regulated by higher levels of government (State or Federal), there is an additional reason to believe that the costs of poor performance will be greater for private organizations. Research has shown that public agencies are far more likely to

win appeals of sanctions than private firms, and thus the costs of enforcement actions against private firms are less costly for regulators than similar actions against public agencies (Durant 1985; Wilson and Rachal 1977; Konisky and Teodoro 2016). Because of this, regulators are more likely to impose harsh sanctions on private firms than public agencies (Konisky and Teodoro 2016). Combined with the greater success rate of appeal among public agencies, this means that the expected regulatory cost of poor performance should be greater for private firms than public agencies. Because of their lower rate of appeal success and the stronger regulatory punishments, private utilities are more accountable to state level environmental agencies than public utilities. This difference in accountability means that the regulatory costs will be higher for private utilities. This is what Konisky and Teodoro (2016) mean when they question whether government can regulate itself. The literature thus far suggests that government often struggles to regulate other governments, but is largely capable of regulating private firms.

Based on what has been discussed so far, it would be safe to expect that private firms should outperform public organizations. The costs of providing services is lower for private organizations due to the lack of political pressure, and the costs of poor performance can additionally be assumed to be greater for private firms due to market pressures and, when regulation is present, more stringent penalties for non-compliance. Both logic and empirical evidence support the idea that private performance should be higher than public overall (Konisky and Teodoro 2016; Lindsay 1976; Levin et al. 2002). What these arguments miss, however, is that the relative performance of public and private organizations may be conditional on citizen engagement. Indeed, the same

political pressures that make public service provision costly for public organizations may also make poor performance extremely costly. Konisky and Teodoro (2016) seem to recognize this in suggesting that public agencies may face some "reputational" cost for poor regulatory performance, but argue that this is dwarfed by the costs private firms face from market competition. This may be true in some cases, but it should be conditional on the level of public participation and engagement. It is possible that the costs of inadequate performance for public agencies may be dependent on the level of citizen attention and engagement, or what Putnam et al. (1983, 1988) would call "political culture."

Those who argue that dependence on political processes make it difficult for public agencies to obtain the resources necessary for high quality service provision seem to recognize the crucial insight from public administration that public agencies are more likely to be influenced by citizens than public firms. What they perhaps understate is that the same local political pressure that leads to lower revenues among public agencies may also greatly increase the costs of poor service performance. Especially in the case of services related to public health, such as the provision of drinking water, poor performance does not only mean an agency has failed to adequately provide a service, it means putting citizens at risk. In cases like this, the cost of poor performance may be great. The downward pressure of the ballot box on revenues may increase the difficulty of quality service provision, but local government accountability to the ballot box should also increase the costs of poor performance. Dissatisfied citizens can use their vote to punish governments who fail to provide quality services. More likely, elected officials

may feel political pressure to punish agencies that incur public anger through poor performance. This seems that it may entail more than a "reputational cost." In the case of public agencies, the costs of poor performance may actually be large political costs.

Of course, the political costs for poor performance faced by public agencies may not be homogeneous. One of the major insights of Putnam et al. (1983, 1988) is that government performance will reflect the relative level of citizen political engagement. When citizens are engaged and participatory, government performance will be high. Where citizens are not active, however, government performance will suffer. This finding is mirrored in the more recent literature on environmental justice, where one of the major contributions is that politically active communities who are able to mobilize are those that are least likely to face environmental harms (Hird and Reese 1998). It is the collective action of citizens, or perhaps more accurately, the *potential* for collective action among citizens that mitigates potential dangers of pollution and non-compliance (Konisky and Reenock 2013). It is easy to understand how this logic can apply to agency performance. When faced with citizens who are politically engaged, public agencies will face higher costs for poor performance, since the government will be more likely to be punished by citizens. To be clear, this is not an argument that citizens are constantly engaging with public service providers. Rather, I would suggest that latent potential for collective action acts as a threat against poor performance in public agencies, in much the same way that popular initiatives act as a constraint on legislative behavior at the state level (Gerber 1996). It is the latent potential for action in citizens, rather than

constant direct action, which increases the potential cost of poor performance for public agencies.

In this way, the assumption that the market costs faced by private firms are greater than the political costs faced by public agencies for poor performance should be conditional. Indeed, while Lindsay (1976) noted that private organizations should be more responsive to consumer demands because of market signals, engaged citizens may send an even stronger signal of displeasure with performance than the market.

Where public participation is not high enough to raise the political costs of poor performance, it may remain true that private organizations should outperform public. Where the potential for collective action is great, however, the political costs of poor performance will be high, and the argument that private firms will outperform public agencies may no longer hold. Because citizens have more direct access to public agencies than private firms, public agencies should be more responsive to politically active citizens. Therefore, the performance gap between public and private organizations should decrease as political participation increases. This theoretical expectation can be seen in Figure 1. I remain uncertain as to whether the performance of public organizations will become greater than private firms at certain levels of public participation, but the important point is that because political pressures increase the cost of poor performance for public agencies, the difference in performance decreases.

Two testable interactive hypotheses follow directly from this theoretical logic. All else being equal, I expect that:

H1: *Public participation will have a larger positive effect on public organization performance than private firm performance.*

Hypothesis 1 follows directly from the public administration literature. Because of the greater institutional access citizens have to public agencies, they should be far more responsive than private to increasing public participation.

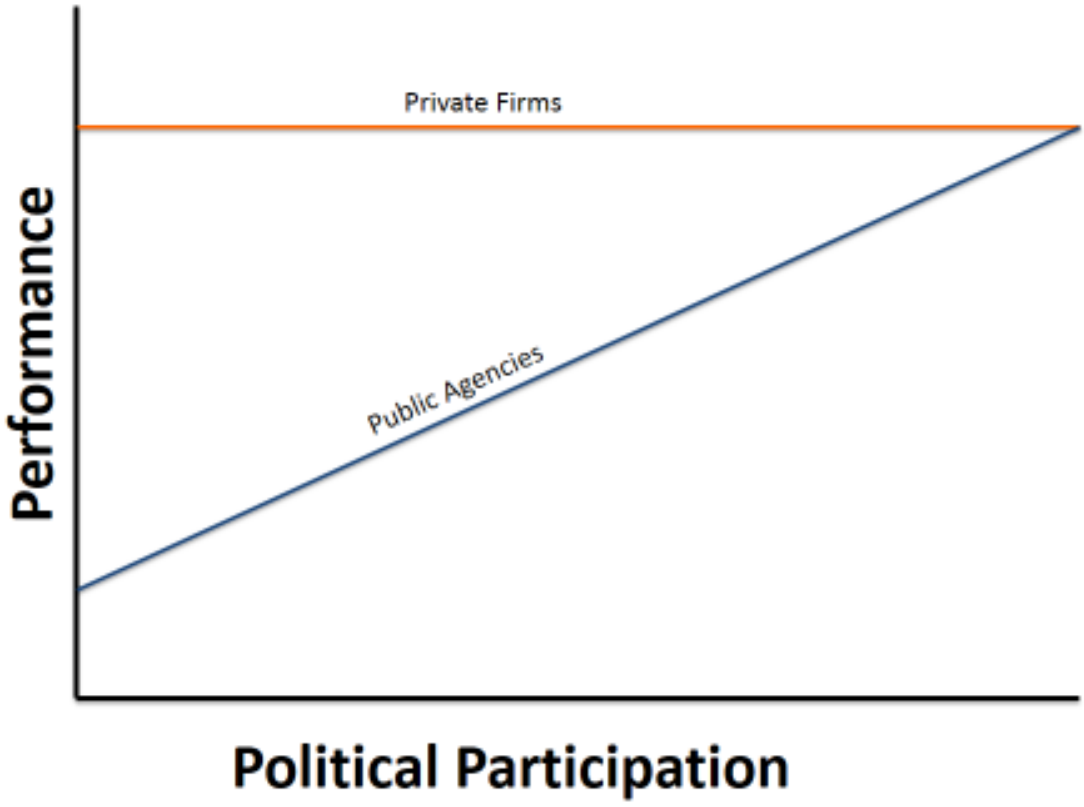
H2: *The performance gap between private firms and public agencies will shrink as public participation increases.*

The literature to this point provides good reasons to believe that private firms, all else being equal, should outperform public organizations with regards to the provision of public goods. Hypothesis 2 suggests that this will only conditionally be the case. While private firms may greatly outperform public agencies in low participation areas, I expect that the performance gap will decrease as public participation increases.

Data and Models

As mentioned, the empirical subject of this chapter is private and public utility regulatory compliance. I specifically look at private and public utility compliance with the 1974 Safe Drinking Water Act. The SDWA, amended in 1986 and 1996, regulates drinking water sources in the United States. The SDWA applies to all utilities in the United States, and requires them to meet certain regulatory standards in treating and distributing drinking water. The SDWA additionally requires utilities to follow specific

Figure 1. Theoretical expectation of the effect of participation on performance.



procedures with respect to the testing of water and the reporting of water quality to the public. The SDWA is administered through the cooperative federalism framework that applies to most of the major environmental laws passed in the 1960's and 1970's. While the federal government, through the Environmental Protection Agency, sets national standards, states have the opportunity to set their own standards that are at least as stringent as those set at the national level.

Drinking water compliance is an excellent area to study the differences between the responsiveness of public and private organizations. Crucially, as discussed earlier,

drinking water privatization is a topic of increasing importance and interest in the scholarly and policy communities. Understanding how public and private utilities differentially respond to the citizens they serve is crucial for the evolving debate over drinking water policy. SDWA compliance is also a good area to investigate the differences because while public and private organizations often face differing organizational goals, SDWA compliance is a shared goal for all utilities, and the SDWA applies relatively universal regulatory standards. This makes for a simple comparison between public and private utility performance.

I draw on data for this analysis from a number of sources. I obtained utility and compliance data from the Safe Drinking Water Information System (SDWIS) database. In the present analysis I evaluate municipal and private utilities designated as medium or larger by the EPA, which includes all utilities serving populations of 3,300 or more. Demographic data were obtained from the 2009 American Community Survey (ACS) 5-year estimates. For many of the private utilities, the SDWIS contained information on what cities and census designated places (CDPs) were served by the utility. For those utilities where the information was not available through the SDWIS, I used website information to match private utilities to CDPs.

One of the most challenging parts of comparing private and public utility responsiveness to citizen participation is finding an adequate measure of political participation at the utility level. For a large N analysis, finding an actual measure of citizen participation in utility decision-making is not possible. The best available proxy measure, although certainly not a perfect measure of democratic participation, is voting

turnout in presidential elections. While it is certainly true that voting turnout in a presidential election is not directly related to participation in local government affairs, it provides the best available measure of general political participation. Still, even a measure of presidential election turnout at the local level is fairly difficult to find. Presidential election turnout is typically available at the county level. County level turnout measures are not desirable for a number of reasons. The populations within counties are not homogeneous, meaning attributing county level participation to the local level would mean introducing error into the models. This is compounded by the fact that this error would be systematic rather than random: utilities that serve large proportions of the county population would have small amounts of measurement error, while those that serve small populations relative to the county as a whole would have larger measurement error. While there are statistical corrections for this error heterogeneity, they are not ideal solutions. Additionally, the size of counties varies greatly across states, further compounding the problem.

For these reasons, it was important to find an alternative measure. Rather than using county level turnout data, I made use of the precinct level voting dataset assembled by Ansolabehere and Rodden (2011). The Ansolabehere and Rodden data contain precinct level election returns for the 2008 presidential election, with data on the number of individuals who voted in the election in a given precinct. In addition to data on the number of voters in the presidential election, for 30 states, Ansolabehere and Rodden were able to match individual precincts to voting tabulation districts from the 2010 census. Using census data, they were able to come up with measures of the 2010 voting

age population in each precinct. Although it would be more desirable to have data on voting age population for 2008, the 2010 population data represents a reasonable measure of the voting age population, especially once the data were aggregated. Any error should be small, and there is no reason to believe that population growth will be correlated with the error term. For all precincts in the 30 states that were available, I was able to obtain voting data and population data in order to create a measure of voter turnout.

The Ansolabehere and Rodden precinct data contained GIS shapefiles for all the voting precincts in the 30 states. After obtaining CDP shapefiles from the Census Bureau, I was able to match the cities and CDPs served by the public and private utilities with the precincts they overlapped using GIS. I then aggregated the precincts within the service areas to obtain measures of votes and voting age population within the cities and CDPs served by the private and public utilities for the 30 available states, and produced a measure of presidential voting turnout for 2008. In total, turnout data were obtained for 3,451 utilities.

The dependent variable in this analysis is violations of the SDWA in 2009. Violations of the SDWA can be grouped into two distinct categories. First, *health violations* relate to utilities' ability to control the level of contaminants in the water supply. These types of violations include maximum contaminant limit violations, which occur when a utility's water contains contaminants above regulatory limits, and treatment technique violations, which occur when a utility does not follow the appropriate treatment methods. I call the other type of violations *management violations*.

SDWA regulations require utilities to follow certain protocols for testing water, filing reports, and communicating with the public. Because of the difference between health and management violations, they are modeled separately in this analysis. That they are poorly correlated (p=.04) only further affirms this decision. Management violations are far more common that health, with utilities committing an average of 1.35 management violations and 0.27 health violations in 2009. Descriptive statistics for all variables can be seen in Table 1.

Table 1: Summary Statistics for SDWA Variables

Continuous Variables	Mean	Std. Dev.	Min	Max
Health Violations	0.27	1.24	0	24
Management Violations	1.35	7.04	0	137
% Turnout	55.47	12.92	6.41	98.89
% Black	9.55	16.62	0	98.45
% Hispanic	9.85	16.54	0	100
% Below Poverty	12.48	8.99	0	63.3
Median Income (Thousands)	45.67	20.20	10.28	202.29
% with Bachelor's Degree	21.31	13.08	0	86.10
Logged Population Served	9.46	1.10	8.10	15.23
Binary Variables	**Percentage**			
Private	13.65			
Purchased Water	24.63			
Groundwater	46.10			

N=3451

The distinction between these types of violations is potentially important for the analysis here. While health violations are perhaps more directly related to the primary goal of the SDWA, which is to provide safe drinking water to all individuals living in the United States, they are potentially a less reliable measure for estimating political and

ownership effects of the kind explored in this analysis. Whether a health violation is incurred is often outside of the control of managers (Teodoro 2014). While they may be the result of a poorly operated facility, it is also often the case that source water quality and vulnerability may cause health violations that are outside of the control of utility employees (Teodoro 2014; Levin et al. 2002). In addition to being less frequent, health violations are simply subject to more randomness than management violations. Just as Teodoro (2014) notes that they may be a clearer measure for evaluating the impact of professionalism on SDWA compliance, a count of the management violations may actually be a more effective measure for evaluating the effect of the interaction between turnout and privatization. For this reason, I expect that any observed relationships between ownership, turnout, and performance will be stronger for management violations than health.

There are two major independent variables in the analysis, as well as an interaction between the two. First, I included a dummy variable for whether a utility is public or private. Approximately 14 percent of the utilities included in the dataset were private. Second, I included the measure of voting turnout in the presidential election of 2008. The mean turnout was about 55 percent.

I also included a number of control variables in the analysis, using both utility and demographic controls. First, the SDWIS contains data on a number of utility characteristics. Utility size has been shown to have a large impact on the number of violations committed by utilities (Teodoro and Switzer 2016; Scheberle 2004). The SDWIS includes data on the population served by the utility. A linear relationship

between this measure and violations is unlikely, since the difference between serving 4,000 and 5,000 individuals is far more meaningful than the difference between serving 50,000 individuals and 51,000 individuals. For this reason, I took the natural log of the population served measure for inclusion in the analysis. Additionally, the SDWIS contains data on the utility water sources, specifically whether the utility primarily purchases its water and whether the utility's primary source water is groundwater or surface water. Groundwater tends to have fewer contaminants than surface water, so utilities that use groundwater as their primary source will have an easier time meeting the health requirements of the SDWA than those utilities that use surface water. Similarly, utilities that purchase their water from wholesale providers will tend to have fewer health violations, since the wholesale provider is responsible for initial source quality and treatment (Wallsten and Kosec 2008). Dummy variables were included for utilities that utilize groundwater and purchase their water from wholesale suppliers.

There are also a number of demographic characteristics that may be correlated with both turnout and violations. The environmental justice literature has long noted that poor and minority communities may face worse environmental outcomes than others (Hird and Reese 1998; Konisky and Reenock 2013; Switzer and Teodoro forthcoming). In order to ensure that any observed relationship between turnout and violations is not the result of unobserved demographic characteristics correlated with both turnout and violations, I include a number of demographic controls in the model. I include measures of percent black population, percent Hispanic population, median household income, percent below the poverty line, and percent with a bachelor's degree and higher.

Since the dependent variables are measured as counts, and since statistical testing showed that the counts are overdispered, using the negative binomial maximum likelihood estimator is the appropriate modeling choice. Since the hypotheses are interactive, an interaction between the private dummy variable and turnout is appropriate. I ran the models as both interactive and non-interactive models to show that Konisky and Teodoro's (2016) major finding, that private generally outperform public still holds. Therefore, four models were estimated, one interactive and one non-interactive for each of the two types of violations. Because SDWA regulatory requirements differ across states and because turnout varies widely depending on states, I also included state fixed effects in the models.[1]

Findings

The results of the four models can be seen in Tables 2 and 3. The models of greatest interest are the interactive models (2) and (4), although comparison with the non-interactive models (1) and (3) is also useful. Negative binomial coefficients are not easily interpretable on their own, and this is compounded by the inclusion of the interactions. Because of this, I use marginal effects to interpret the interactive relationship between ownership and turnout. Table 4 shows the marginal effect of turnout on violations for public and private utilities, while Figures 2 and 3 show the marginal effect of privatization on violations across levels of turnout.

[1] Compliance is often modeled as a binary phenomenon. For this reason, logistic regression models are included in the appendix. The results do not substantively change. Also included in the Appendix are split sample models that explore the effect of turnout on private and public utilities in separate models rather than using interactions. The results of the split sample models provide strong support for the hypotheses.

Health models

Beginning with the results for health violations, seen in Table 2, we can see that Konisky and Teodoro's (2016) finding that public organizations commit fewer regulatory violations seems to hold. The non-interactive model (1) shows that private utilities commit far fewer health violations of the SDWA than public utilities. On average, private utilities commit fewer than half as many violations as public utilities. Interestingly, election turnout in the non-interactive model does have a strong and significant negative relationship with health violations, with a one standard deviation increase in turnout leading to a 0.05 decrease in the expected number of health violations, equivalent to an approximately 21 percent decrease. I am not, however, primarily interested in the direct effects of privatization and turnout. Instead, the interaction between the two that is of greatest interest.

The interactive model (2) provides some support for the hypotheses. The interaction between ownership and turnout is not significant at conventional levels, but it is substantively large and in the expected direction. The negative effect of turnout is greater for public utilities than private. Support for H1, which suggested that public organization would be more affected by participation than private, can be seen in the first column of Table 4. The marginal effect of turnout on health violations is negative and statistically significant at the .05 level for public utilities, while it is substantively small and insignificant for private utilities. Although these effects are not statistically significant from each other, there is some evidence that the effect of turnout on health violations is greater for public utilities than private. In substantive terms, the difference

is quite striking. The effect of a one standard deviation increase in turnout for public utilities results in a 21 percent reduction in the expected number of health violations, while the same change in turnout only results in a four percent expected decrease for private utilities.

Table 2: Negative Binomial Model Predicting Health Violations

	(1)		(2)	
	Coefficient	p-value	Coefficient	p-value
Private	-0.75	<.01	-1.36	.21
	(0.26)		(1.09)	
Election Turnout	-0.02	.04	-0.02	.04
	(0.01)		(0.01)	
Private X Turnout			0.01	.57
			(0.02)	
% Black	-0.00	.74	-0.00	.75
	(0.00)		(0.00)	
% Hispanic	-0.01	.03	-0.01	.03
	(0.01)		(0.01)	
% Below Poverty	-0.01	.60	-0.01	.60
	(0.01)		(0.01)	
Median Household Income	-0.00	.10	-0.00	.11
	(0.00)		(0.00)	
% w. Bachelor's Degree	0.01	.15	0.01	.17
	(0.01)		(0.01)	
Purchased Water	-0.67	<.01	-0.67	<.01
	(0.20)		(0.20)	
Ground Water	-0.36	.04	-0.36	.04
	(0.17)		(0.17)	
Population Served (Logged)	-0.37	<.01	-0.37	<.01
	(0.08)		(0.08)	
Constant	3.81	<.01	3.87	<.01
	(1.11)		(1.12)	
Observations	3451		3451	
AIC	3280.82		3282.50	
Log Likelihood	-1599.41		-1599.25	
LR-Test ($\chi 2$)	0.32			
Prob>$\chi 2$	.57			

Note: Standard Errors in parantheses. Models also include state fixed effects.
Likelihood Ratio Test of whether interactive model improves on no interaction model.

Figure 2. Marginal effect of privatization on health violations.

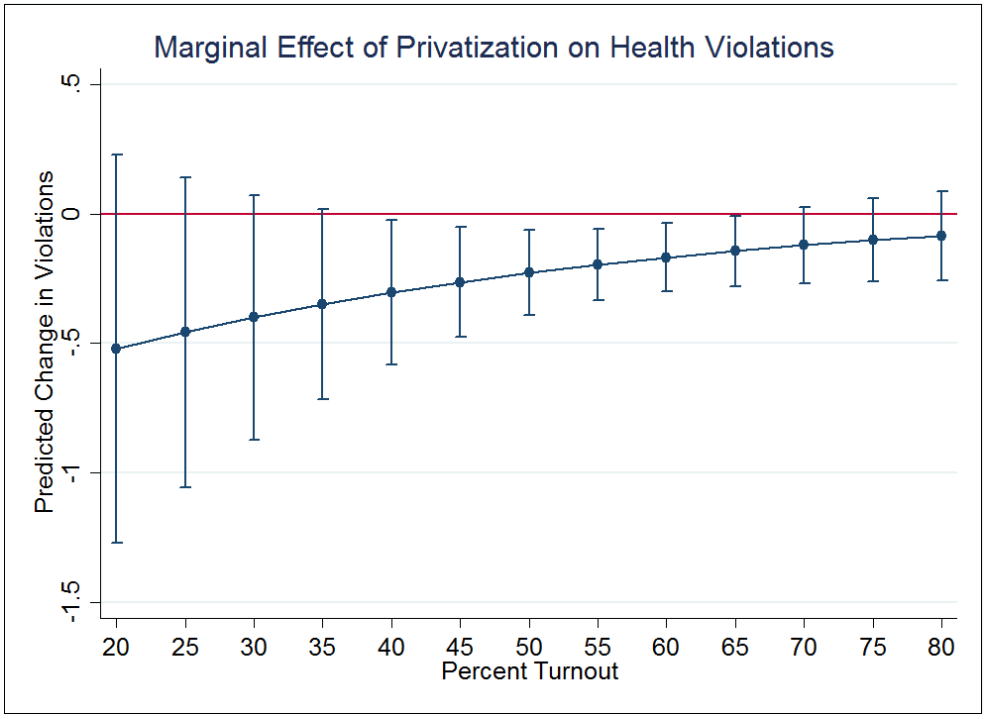


Figure 2 provides support for H2, which suggested that the gap between private and public organizational performance would decrease as participation increases. Again, while the interactive term is not statistically significant, the substantive effects are quite large. In the case of dummy variables, marginal effects can correctly be interpreted as the predicted difference between the two categories. As Figure 2 shows, the predicted difference between public and private utilities decreases as turnout increases. While at low levels of turnout the difference between private and public utilities is quite large, the difference is much smaller at high levels of turnout. As an example of the substantive size of this change, the predicted difference in the number of health violations between public and private utilities when turnout is one standard deviation below the mean is

0.28. One standard deviation above the mean, the difference in the predicted number of health violations has dropped to 0.12. The predicted difference is more than halved by moving two standard deviations.

In general, although the interactive term was not significant at conventional levels, the effects from the health models provide some support for both H1 and H2. The effect of turnout was higher for public utilities than private, and the regulatory gap in health violations between private and public drops as turnout increases.

Management models

Moving to the results for the management models, we can again see in the non-interactive model (3) that both ownership and turnout have significant effects on the number of violations. Consistent with Konisky and Teodoro (2016), all else equal, private utilities commit far fewer management violations than public, with an average of 0.47 fewer predicted violations. Turnout has a strong negative effect, with a one standard deviation increase leading to a 0.23 decrease in the number of management violations, equivalent to a 17 percent decrease in the predicted number of violations. Once again, however, the interactive model (4) is of primary interest here.

While the results were somewhat mixed for the interactive health model, since the interaction term was not significant at conventional levels, the results for management violations provide strong and unambiguous support for the hypotheses. The interaction terms is statistically significant and the effect sizes are substantively large. The stronger results should not be surprising, given the less random and more procedural nature of management violations. That health violations are both less common and often

out of administrator control means the stronger results for management were to be expected.

Table 3: Negative Binomial Model Predicting Management Violations

	(3)		(4)	
	Coefficient	p-value	Coefficient	p-value
Private	-0.37	.05	-2.29	<.01
	(0.18)		(0.80)	
Election Turnout	-0.01	.02	-0.02	<.01
	(0.01)		(0.01)	
Private X Turnout			0.03	.01
			(0.01)	
% Black	0.00	.93	0.00	.84
	(0.00)		(0.00)	
% Hispanic	0.01	.14	0.01	.10
	(0.00)		(0.00)	
% Below Poverty	-0.00	.67	-0.00	.68
	(0.01)		(0.01)	
Median Household Income	-0.00	.07	-0.00	.06
	(0.00)		(0.00)	
% w. Bachelor's Degree	0.01	.30	0.01	.36
	(0.01)		(0.01)	
Purchased Water	-0.30	.05	-0.29	.06
	(0.15)		(0.14)	
Ground Water	-0.41	<.01	-0.39	<.01
	(0.14)		(0.14)	
Population Served (Logged)	-0.36	<.01	-0.35	<.01
	(0.06)		(0.06)	
Constant	2.74	<.01	2.76	<.01
	(0.80)		(0.81)	
Observations	3451		3451	
AIC	5715.29		5711.19	
Log Likelihood	-2816.64		-2813.60	
LR-Test ($\chi 2$)	6.09			
Prob>$\chi 2$	.01			

Note: Standard Errors in parantheses. Models also include state fixed effects.
Likelihood Ratio Test of whether interactive model improves on no interaction model.

In substantive terms, the results reveal a large difference in the effect of turnout on public and private utility performance. Support for H1 can be seen in the second column of Table 4. The marginal effect of turnout is large, negative, and significant at the .01 level for public utilities, while the effect is small, positive, and insignificant for private utilities. These effects are significantly different from each other. While a one standard deviation increase in turnout results in a 24 percent predicted decrease in the number of management violations for public utilities, the same increase leads to a statistically insignificant increase in the number of management violations for private utilities.

Table 4: Marginal Effect of Turnout for Public and Private Utilities

	Health Model			Management Model		
	M.E.	Std. Error	p-value	M.E.	Std. Error	p-value
Public Utilities	-0.01	(0.00)	.05	-0.03	(0.01)	<.01
Private Utilities	-0.00	(0.00)	.71	0.01	(0.01)	.26

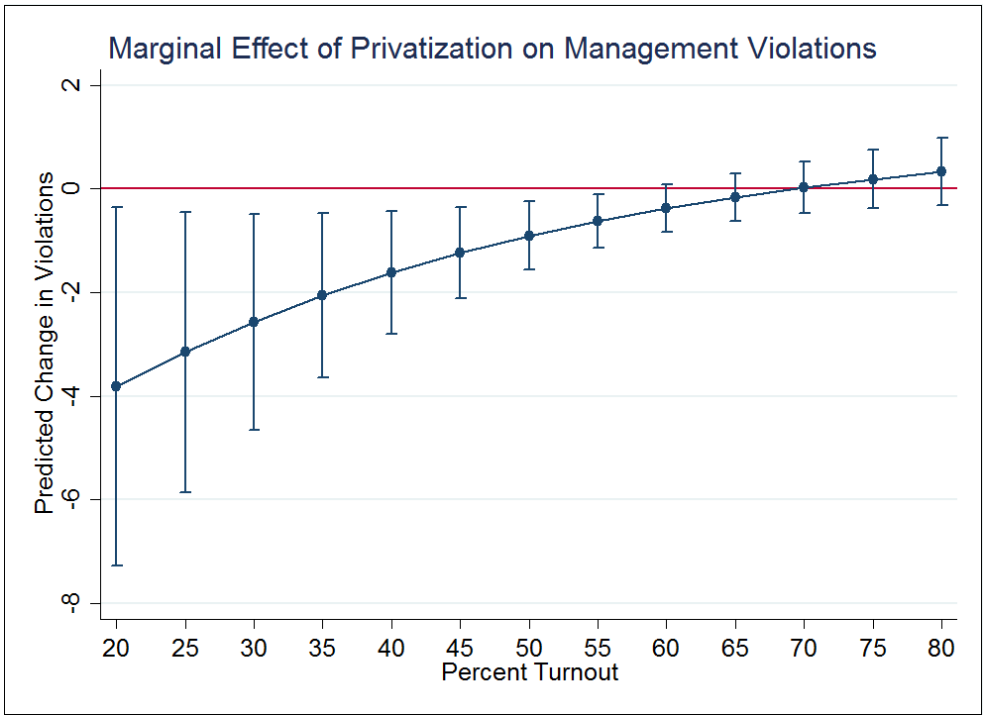
Note: All other variables at means.

H2 is also strongly supported by the management violation interactive model. As can be seen in Figure 3, there is a large predicted difference between public and private utilities at low levels of voter turnout, while there is almost no difference at high levels of turnout. Indeed, at very high levels of turnout, private utilities are actually predicted to have more violations than public, although the difference is not significant at conventional levels. The substantive size of the change in the gap is very large. At one standard deviation below mean turnout, a public utility is predicted to have 1.42 more

management violations than a private utility, all else equal. This difference is significant at the .01 level. At one standard deviation above the mean, this gap has closed to only 0.03, and the difference is nowhere near statistical significance. Essentially, simply moving from a below average turnout area to an above average turnout area changes the regulatory gap from extremely large to statistically nonexistent.

The management models provide extremely strong support for both H1 and H2. The effect of turnout on management violations is strong and significant for public utilities and non-significant for private. Additionally, there is clear evidence that the regulatory gap between private and public utilities disappears once turnout is high enough.

Figure 3. Marginal effect of privatization on management violations.



Discussion

In this chapter, I advanced a new theoretical argument about the effect of citizen participation on the relative performance of public and private utilities. Expanding on previous theories of the differences between public and private organization, I argued that the political and economic incentives facing public and private utilities, largely driven by the political venues to which they are accountable, would lead to private utilities outperforming public overall, but with the expectation that this difference in performance would be conditional on citizen participation. When citizens are engaged, the political cost of poor performance for public organizations is significant. Because of the connection to political principals who depend on voters for support, public organizations may suffer great political costs when they fail to provide adequate services. When these political costs are large enough, the difference between public and private performance shrink. In general, the models provide strong evidence for the idea that public utilities will be more responsive to citizen participation than private utilities. In both the health and management models, voter turnout had a strong and negative effect on the number of violations committed by municipal utilities, while not having a statistically significant impact on the number of violations committed by private utilities. While private utilities outperformed public in general, I found that this was conditional voter turnout, with the regulatory gap between private and public utilities shrinking as participation increased.

It should be noted, however, that while the regulatory gap between private and public utilities shrank, and at higher levels of turnout, disappeared, there is little

evidence that public utilities outperform public at any level of turnout. It appears to be the case that turnout increases the political costs of non-compliance to the point where municipal utilities perform relatively equally to private utilities, but no better.

Conclusion

These results hold important implications for utility privatization. While it is evident that private utilities do outperform public utilities in general, this finding suggests that this is an extremely conditional relationship. Crucially, it is the different venues of political accountability, and the incentives created by these venues that help explain this result. With private utilities, because of the nature of public utilities commissions, raising revenues may be no problem, since they are assured of a profit. The incentives facing public utilities often mean they will struggle to raise the revenues necessary for good performance. What previous literature on the topic has missed is the responsiveness of local governments to citizen engagement. Indeed, we might consider this to be a Tocquevillian observation. Where citizens are engaged and active, local governments respond with quality service provision. Where they are not, privatization (and therefore centralization) may do a better job.

The findings also hold important implications for environmental regulation. One of the major implications of Konisky and Teodoro (2016) is that centralized governments may struggle to regulate public utilities, leading to a regulatory gap. These findings point to a potential caveat. While public utilities may not be fully accountable to state regulatory agencies due to lesser sanctions and greater ability to appeal, it appears

that engaged citizens may mitigate the regulatory issues. When governments fail to regulate governments, citizens may hold them accountable.

CHAPTER IV

PRIVATIZATION AND RATE STRUCTURES: THE EFFECT OF PARTISANSHIP, MOISTURE, AND INEQUALITY

Chapter III explored the implications of privatization for public health, investigating the differences between public and private utility compliance with the SDWA. While compliance with the SDWA is a key goal of utilities, it is not their only operation. In this chapter, I explore the difference between private and public utility rate setting, with special attention on the responsiveness of utilities to local context. Once again, the important question here is how the political incentives facing public and private utilities shape their decision making. Since public and private utilities operate in very different political settings, local conditions may not have the same impact on decision-making. The goal of this chapter is to explore how that difference in political setting and incentives influences the crucial policy choice of rate structure.

While there has been research comparing the prices of water charged by private and public utilities (Food and Water Watch 2016; CBO 1982), to my knowledge there has yet to be an analysis that looks at what local factors influence private and public utility rate structures. Revenues and rate structures are not directly related and have very different implications. Crucially, the adoption of rate structures is important policy for conservation and redistribution, and is among the most important activities that utilities carry out. Adopting increasing block rate structures, which charge higher prices per unit for high volume users, benefits lower income customers and encourages water

conservation. The importance of these types of rates is largely determined by the context that the utility operates in. If there is a large water supply and little citizen demand for progressive rates, a utility may not need to adopt them. Where demand is high and supply is low, however, the type of rate structure selected takes on a great deal of importance. The question here is whether context differentially impacts the rate setting of private and public utilities. The literature in public administration gives strong reason to believe that public organizations will be more responsive to external influences than private, and the political venues in which private and public utilities operate differ greatly. There is good reason to expect that public utilities will be more responsive to local needs than private.

The chapter begins with an overview of the literature in public administration that discusses the responsiveness of public and private organizations to external influences. I then discuss the setting of utility water rates and the differences between public and private rate setting, developing a series of testable hypotheses. I argue that while public utilities should be highly responsive to customer needs in context, the political incentives facing private utilities mean they should not be as responsive.

Testing these hypotheses with an original dataset drawn from a number of sources, I find that while public utilities are more likely to adopt increasing block rate pricing structures in general, there is little statistical difference in responsiveness to local conditions. Local moisture levels, inequality, and citizen partisanship have essentially equivalent effects on rate adoption for both public and private utilities. While privatization may indeed mean a lower probability of the adoption of rates that are

progressive and conservation oriented, private utilities do not appear to be any less influenced by the context in which they operate.

Ownership and Citizen Influence

The literature in public administration has had a lot to say about the differences between public and private organizations. One of the enduring questions in public administration is how ownership influences organizational management and performance. A significant body of literature addresses the differences between how public agencies and private firms provide public services (Meier and O'Toole 2011; Rainey and Bozeman 2000; Rainey et al. 1976). While the literature has noted a significant number of differences between the private and public sectors, including employee attitudes (Bullock et al. 2015), organizational structure (Rainey et al. 1995), and administrative procedures (Lan and Rainey 1992; Rainey et al. 1995), one of the major theoretical differences between public and private organizations is the influence of external stakeholders (Rainey et al. 1976). Because of their connection with political processes and elected officials, public agencies should be far more responsive to external stakeholders, especially citizens. The differing incentives faced by public and private organizations suggest that public agencies should be more responsive to external influences than private firms (Boyne 2002). While private firms are supposed to answer primarily to shareholders, public agencies face multiple institutional incentives, and are subject to multiple political principals (Dixit 1997; Rainey et al. 1976). Most crucially for the purposes of this analysis, that public agencies are influenced by popular elections and political appointments means that the meeting the interests of citizens and "public

opinion" is far more important for the decision-making of public agencies (Rainey et al. 1976). Indeed, it is fundamentally because of the connection between public agencies and the political world that they should be responsive to citizen demands.

In what few empirical tests have been done of the difference in responsiveness to external stakeholders, however, the results have been mixed. Lachman's (1985) study of CEOs in Israel found that public and private did not perceive external influences in different ways. Baldwin (1990) found that public agencies in Atlanta experienced more pressure from external influence than did private agencies. Similarly, Coursey and Bozeman's (1990) analysis of private and public managers in Syracuse found that the decisions of public organizations experienced greater participation from outside of the organization. Despite the relatively sparse empirical testing of this theoretical idea, the logic remains sound. Due to the connection between public agencies and political processes, external stakeholders, most crucially citizens, should have more influence on public organizations than private. Given the emphasis in public administration on bureaucratic responsiveness to citizens (Roberts 2004, Kathi and Cooper 2005, Vigoda 2002, Feldman et al. 2007), that private organizations may be less responsive to citizen demands is important possibility.

Conservation and Redistribution in Water Rates

The empirical subject of this chapter is private and public utility rate adoption. The pricing model adopted by a utility is a major policy choice. The rate structure that a utility adopts has large implications for water conservation, as well as redistributive effects. Rate adoption is an inextricably political process. In the case of local

governments, rates have to be approved by elected officials, while private utility rates must be approved by public utility commissions at the state level. Rate setting is an ideal area to explore the differences between private and public utilities for a number of reasons. Rate setting is an important part of utility operations, and one of the most politically scrutinized areas. Additionally, due to the redistributive and conservation implications, rates are a critical part of two of the largest critiques levied against private utilities, namely that private utilities will make water unaffordable and that they will be bad for the conservation of water.

There are many varieties of rate structures, but they can be most easily grouped into five basic types (Teodoro 2010a):

1. Flat rates. These rates charge all customers the same price for a fixed time period, regardless of the amount of water consumed.
2. Uniform rates. These rates charge all customers the same price per unit of water.
3. Declining block rates. These rates charge higher prices per unit of water for low volume users, while charging lower prices per unit for high volume users.
4. Increasing block rates. These rates charge higher prices per unit of water for high volume users, while charging lower prices per unit for low volume users.
5. Seasonal rates. These rates charge higher prices per unit in periods of high demand or low supply and lower prices per unit in periods of low demand or high supply.

In this chapter I am concerned with utility adoption of *increasing block rate structures*. Importantly, while both increasing block rate prices and seasonal rates are

considered to encourage conservation, increasing block rates also have progressive redistributive aspects. The redistributive implications of utility rates has been noted since Berry's (1979) seminal article on electricity rates. Indeed, higher volume users of water tend to be higher income individuals with large properties. By adopting increasing block rate pricing structures, utilities charge these higher volume users more for each unit of water above a certain point of volume. In this way, utility customers who use less water benefit under these pricing schemes. Importantly, for most utilities, mean customer consumption is higher than median customer consumption (Chestnutt et al. 1997). This means that the median customer should usually benefit from an increasing block rate structure, since high consumption customers will bear the burden of the increased price per unit for use above a certain level (Teodoro 2010b). Indeed, Mullin (2008) argues that the high correlation between water consumption and income, as well as the right skewed nature of water consumption, makes it a safe assumption that the median voter would benefit under an increasing block rate structure.

Again, in addition to the redistributive element of increasing block rates, they also have major conservation implications. Increasing block rates are considered conservation rates, since they charge higher prices for higher users. If high volume users wish to avoid the higher per unit costs associated with the upper tiers, they have to conserve water.

Importantly, the type of rate structure adopted by a utility is not directly related to the revenues of the utility. Any revenue can be generated from any rate structure if the rates are carefully considered. While an increasing block structure may lead to higher

variability in revenues, adjustments to the number of blocks and prices in each block can ensure revenues at any level (Mullin 2008, Teodoro 2010a).

It should be noted here that the adoption of increasing block rates does not necessarily mean that the residents will choose to conserve water. While in general, increasing block rates are considered conservation oriented, it may be the case that prices in upper blocks are still so low that residents will continue to use large amounts of water despite paying a higher rate at higher volumes of use. The nature of the price elasticity of demand means that even if an increasing block rate structure is adopted, if the cost to high volume users is not sufficiently high, this will have a minimal impact on the amount of water consumed. Simply measuring whether a utility utilizes increasing block rates or not does not capture this nuance. For example, a 20 cent increase per thousand gallons in a higher may have little impact on demand, while a two dollar increase could greatly encourage conservation. Still, in general, increasing block rates do encourage conservation more readily than the other rate structures, and are appropriate for the analysis here.

Privatization and Rate Adoption

It is possible that the privatization of water utilities may have major implications for utility pricing structures. As mentioned, the adoption of water rates is inherently political, but the political venues in which public and private utilities operate are very different. While public utility rates are ultimately decided through local government, and approved by local elected officials, private utility rates have to be approved through rate cases at public utility commissions, which are usually staffed with highly

professionalized utility experts, with commissioners typically appointed by the Governor. These different political venues mean that local constituent preferences may have vastly different impacts on rate adoption in public and private utilities.

Local water rates, especially in western states, can be a tumultuous political issue that can swing local elections.[2] Meanwhile, public utility commissions are home to a much quieter politics. Although grass roots movements and customer protection play a role in the rate setting process in the commissions (Gormley 1983; Campbell 1996), rate cases are generally highly technical affairs with less of a role for citizen input than local governments. Indeed, even the distance from state capitals to local municipalities may discourage citizen participation, since it is far easier for the average citizen to participate in a city council meeting a few minutes from their front door than a public utility commission meeting that may be hundreds of miles away depending on the state. The difference in political venue means we should expect very different responses to local conditions from public and private utilities. While the connection to local government and the highly political nature of water rates means public utilities should be highly responsive to the concerns of their customers, the relatively quiet politics of the commissions means private utilities may not be as responsive.

Importantly, the difference between private and public utility rate setting is not simply one of venue, but also one of process. While the processes governing local adoption of utility rates can vary between local governments, meaning the process can

[2] The most famous example of this is the situation in Tucson, AZ in 1976. The city council approved a change in the water rates, and three city council members were recalled while another one resigned.

be either structured or relatively free flowing, public utilities commissions are required to follow certain procedures when it comes to the setting of private utility rates. Administrative Procedure Acts at the state level require that state agencies follow certain specified processes for rulemaking, and this means that utility rate setting can be quite regimented. This difference in procedural rules may determine the relative influence of citizens on the policy making process.

With this in mind, it is possible to develop a number of hypotheses relating to utility rate adoption for private and public utilities. First, there is good reason to expect that public utilities will adopt increasing block rate pricing at higher rates than private. As mentioned, it is reasonable to assume that the median voter in most areas would prefer progressive rate structures to alternative approaches. The right skewed nature of consumption means most would benefit under increasing block rates, regardless of the conservation implications. It should be noted, however, that there is little independent reason for private utilities to adopt increasing block rate structures. As mentioned, while revenues may not be directly related to rates, an increasing block rate structure may lead to more variability in revenues, and thus more uncertainty. Since private utilities may be more committed to ensuring revenues at a certain level, in a vacuum they may consider increasing block rates to be a risky option and choose not to adopt them. Public utility commissions may encourage increasing block rate adoption for a number of reasons, but since there is less political pressure in general, it is likely that in the aggregate public utilities will be more likely to adopt increasing block rates than private. From this logic, I develop my first hypothesis:

H1: *Public utilities will be more likely to adopt increasing block water rates.*

In addition to ownership, utility rate structures may be determined by contextual variables. The need for increasing block rates may be more evident in certain contexts than others, and customers with different ideological views may demand progressive rates. In this way, utility context and the nature of customers will largely determine whether a utility adopts increasing block rates or some other pricing structure. Research has shown that local climate conditions have a large role in the adoption of increasing block rates, and are perhaps the most important determinant in the adoption of progressive pricing (Mullin 2008; Teodoro 2010a, 2010b). Utilities in drier regions have a greater need to value water resources, and therefore the adoption of increasing block rates may become more desirable. Additionally, water issues may be a higher priority for local governments in drier areas, which may lead them to adopting rates that are closer to median voter preferences (Mullin 2008). This is the reason for my second hypothesis:

H2: *Utilities in drier areas will be more likely to adopt increasing block water rates.*

There are also the redistributive implications of rates to consider. It is possible that the relative distribution of income and wealth among citizens may help determine whether progressive rate adoption is desirable for a utility. Importantly, if inequality is high, redistributive policies like increasing block rate water rates may be more desirable for a utility. This logic leads to a third hypothesis:

H3A: *Utilities in areas with higher levels of inequality will be more likely to adopt increasing block water rates.*

Importantly, however, while the median customer may prefer increasing block rates, the median customer may not have the loudest voices in local government. Those who would pay the most, the highest volume users, often are at the center of local controversies over water rates. Thus, the effect of inequality may actually be the opposite. As income inequality increases, so should inequalities in political power. If inequality is higher, this may increase the incentive of higher volume users to pressure the local government against adopting progressive policies, including increasing block rates. This means that the third hypothesis can be considered two competing hypotheses, with the second being:

H3B: *Utilities in areas with higher levels of inequality will be less likely to adopt increasing block water rates.*

Finally, the political preferences of citizens may determine whether a utility adopts progressive rates or not. In general, more liberal citizens would be expected to call for increasing block rate pricing. Political ideology and partisanship play important roles in citizen desire for environmental policy (Liu et al. 2014). Since increasing block rate pricing encourages the conservation of water, it is likely that more liberal customers bases would find them desirable. Additionally, the redistributive nature of the rates would make them desirable to liberal citizens as well. This provides the impetus for the fourth hypothesis:

H4: *Utilities in more liberal areas will be more likely to adopt increasing block water rates.*

Finally, I expect that each of the contextual variables will matter more for public utilities than private. Since public utilities are likely to be more responsive to local citizens than private due to the political contexts in which rate decisions are made, each of the contextual variables should have a larger effect for utilities owned and operated by local governments than private utilities. Climate may be involved in public utility commission decision making, as is the case in California, but it would still be expected that public utilities be more responsive in general. Local inequality should also play a larger role in public utility rate setting than private. While public utility commissions often have customer advocacy organizations responsible for representing customer interests and it is possible that inequality will play a role in politics at the state level, the expectation would still be that citizens play a larger role at the local level. Finally, local citizen liberalism should have a larger effect on public rate setting than private. Any effect that citizen political preferences have at the state level should be the result of state level politics. Since governors appoint public utility commissioners, it is possible that state politics may determine the decision-making at the commission, but the highly technocratic nature of the commissions mean they may not be as responsive. The expected higher responsiveness of public utilities compared to private lead to the three final hypotheses:

H5: *Area dryness will have a greater effect on public utility rate adoption than private.*

H6: *Inequality will have a greater effect on public utility rate adoption than private.*

H7: *Citizen liberalism will have a greater effect on public utility rate adoption than private.*

Data and Models

Data were obtained for five different types of variables from different resources: 1) utility rates data, 2) utility information data, 3) climatic moisture data, 4) local inequality data, and 5) local partisanship data. The descriptive statistics for each variable can be seen in Table 5. In this chapter, I investigate investor owned utilities and municipal utilities serving greater than 10,000 in population.

Water rates data

Data on rate structures are drawn from government websites selected through a random sample of 210 utilities, stratified for ownership and size. While the majority of water utilities in the United States are tiny, the vast majority of the United States public is served by large water utilities. If the random sample were not stratified for size, this would lead to relatively little data on larger utilities, meaning the sample would offer little information on the types of utilities that serve large portions of the American public. Additionally, since the primary concern here is the difference between private and public utilities, it was crucial that the sample also be stratified to include enough private utilities to analyze these differences. Only 15 percent of the US population is currently served by private utilities, so a pure random sample would give very little leverage on the crucial question for this analysis. For this reason, I oversampled private utilities so they now represent about 28 percent of the sample. Rates data for all utilities in the sample were available on either local government websites, public utility

commission websites, investor owned utility websites, or through state government utility surveys. I am interested in the adoption of increasing block rate pricing models in this analysis. I coded utilities that use increasing block rate pricing as 1 and utilities that do not have increasing block rates as 0. About 52 percent of all utilities in the sample use increasing block rate structures. 57 percent of public utilities had increasing block rates, while 38 percent of privates utilized them.

Utility data

Utility data were drawn from the Safe Drinking Water Information System (SDWIS), which contains data on each water system into the United States. The SDWIS contained data on ownership. 13 percent of the utilities in the population were privately owned. I also used three control variables from the SDWIS. First, larger utilities may be more likely to adopt progressive water rates. The implementation of increasing block rates may require a higher degree of technical sophistication that smaller utilities may lack (Teodoro 2010a). For this reason, I included a measure of logged population served in the models. It was important to log the population variable to since the effect is unlikely to be linear. The difference between a utility serving 10,000 and 15,000 is more meaningful from a technical perspective than the difference between 100,000 and 105,000. Second, groundwater and surface water sources may be differentially affected by climate, so I included a dummy variable coded 1 if a utility used groundwater as its primary source and 0 if a utility used surface water. Additionally, groundwater may be cheaper to utilize as a drinking water source since it usually requires less treatment. This may also factor into rates decisions. Finally, utilities that purchase their water through a

wholesale provider may not have as much of an incentive to adopt increasing block rates, since responsibility for adapting to changing water resources may fall to the wholesaler (Teodoro 2010a).

For most of the utilities in the dataset, the SDWIS also contained information on what cities and census designated places (CDPs) were served by the utility. For some private utilities, service area information was not available through the SDWIS. For these utilities, I used website information to match private utilities to CDPs.

Moisture data

As noted, local climate conditions are expected to play a large role in the adoption of increasing block rates. Water conservation is a primary reason for the adoption of increasing block rates, and the importance of water conservation will depend greatly on the local climate. Previous studies of rate adoption have found that local moisture levels are the most important factor in the adoption of progressive rates (Mullin 2008, Teodoro 2010a, 2010b). To measure local moisture, I utilize the climatic moisture index (I_m) developed by Willmott and Feddema (1992). The I_m has a number of important advantages over more commonly used measures like precipitation or temperature. The index integrates simple climatic measures like temperature, precipitation, and sunlight with the land's water retention capacity and potential evapotranspiration. In this way, it is a fuller measure of local moisture than simple climatic measures. Another virtue of the I_m is the mathematical elegance of the index. It is bounded between -1 and 1, with negative values representing areas in which the atmospheric demand is greater than the water supply and positive number representing

areas in which the supply is greater than the demand. A value of zero indicates that demand and supply are equal. Willmott and Feddema provide their moisture index on a 0.5 x 0.5 degree spatial grid that covers the entire globe. I matched each of the utilities to the nearest W-F moisture point and calculated the average moisture level from 2004-2014, which is the latest available year. To provide some context for the variable, Phoenix, Arizona has an average moisture index value of -0.81 from 2004-2014, while Boston has an average moisture index of 0.47.

Local inequality data

In addition to having conservation implications, local water rates also have redistributive implications, with increasing block rates benefiting lower consumption customers. For my measure of local inequality, I use the Gini coefficient, which is the most common measure of income inequality. The Gini coefficient ranges from 0 to 1, with 0 representing perfect equality in income and 1 representing maximum inequality. The American Community Survey contains Gini coefficient data for all CDPs in the United States. Using the 2015 5-year estimates, I was able to match each utility to a Gini Coefficient. For the few private utilities serving more than one CDP, I used a weighted average by population of each CDP served by the utility.

Local partisanship data

Finding an adequate measure of citizen liberalism is an especially difficult part of comparing public and private utility rate adoption. While a true measure of citizen liberalism at the local level is not readily available, I adopt the best possible alternative by using a measure of local partisan voting in the presidential election. Still, even a

measure of presidential partisan voting is fairly difficult to obtain. Presidential election data are typically available only at the county level. County level data are not desirable for a number of reasons. First, populations within counties are not homogeneous, meaning introducing error into the model. This heterogeneity is compounded by the fact that this error would be systematic rather than random. Utilities that serve large proportions of the county population would have small amounts of measurement error, while those that serve small populations relative to the county as a whole would have larger error. While there are statistical corrections for this error heterogeneity, they are not ideal solutions. Additionally, the size of counties varies greatly across states, further compounding the problem.

For these reasons, it was important to find an alternative measure. Instead of using county level partisanship, I made use of the precinct level voting dataset assembled by Ansolabehere and Rodden (2011). The Ansolabehere and Rodden data contains precinct level election data for the 2008 presidential election. This data was available for 37 states. These data included the vote total for each precinct for both McCain and Obama. Using precinct level shapefiles and CDP shapefiles obtained from the Census Bureau, I was able to match CDPs to precincts. I then aggregated the precincts within the utility service areas to obtain a measure of the democratic share of the major party vote in the 2008 presidential election.

Table 5: Summary Statistics-Unweighted

Continuous Variables	Mean	Std. Dev.	Min	Max
W-F Moisture Index	0.04	0.40	-0.85	0.50
Gini Coefficient	0.45	0.05	0.35	0.60
Percent Democrat	54.89	15.76	21.86	98.12
Logged Population Served	11.13	1.12	9.25	14.56
Binary Variables	**Percentage**			
Increasing Block Rate	51.90			
Private	28.57			
Groundwater	26.19			
Purchased Water	17.62			

N=210

The dependent variable in this analysis is whether or not a utility has adopted an increasing block rate pricing structure. Since the dependent variable is a dichotomous variable, a logistic regression is the appropriate estimator for this analysis. I estimate two models. The first is a non-interactive model that allows for the direct testing of hypotheses 1-4. I then consider the potential interactive relationships between privatization, moisture, inequality, and partisanship by using an interactive model. Because I used a stratified sample, I estimated the models with estimation weights to account for over and under sampling.

Findings

The results of the two models can be seen in Table 6. The non-interactive model is in column (1), while the interactive results are in column (2). Logistic regression results are not easily interpretable on their own, especially when making use of interactions. Because of this, I use predicted probabilities and marginal effects to display the results in a meaningful way. Figures 4-9 and Table 7 show these results.

Table 6: Logistic Regression Predicting Increasing Block Rates

	(1)		(2)	
	Coefficient	p-value	Coefficient	p-value
Private	-0.921	.043	-1.117	.879
	(0.455)		(7.310)	
Dem %	0.031	.055	0.027	.105
	(0.016)		(0.016)	
Moisture	-4.195	<.001	-3.674	<.001
	(0.811)		(0.913)	
Gini Coefficient	-8.79	.099	-8.357	.131
	(5.329)		(5.535)	
Private*Dem% Interaction			-0.216	.260
			(0.192)	
Private*Moisture Interaction			-7.990	.166
			(5.767)	
Private*Gini Interaction			-24.859	.349
			(26.518)	
Groundwater	0.028	.961	0.056	.923
	(0.565)		(0.582)	
Purchased Water	0.286	.680	0.257	.709
	(0.693)		(0.690)	
Population Served (Logged)	-0.101	.576	-0.102	.604
	(0.197)		(0.197)	
Constant	4.139	.189	3.986	.217
	(3.148)		(3.232)	
Observations	210		210	
AIC	246.180		246.745	
Log Likelihood	-115.09		-112.372	

Note: Standard Errors in parantheses. Models adjusted for survey weights.

Beginning with the non-interactive model, it is possible to evaluate hypotheses 1-4. Looking first at H1, which suggested that public utilities will be more likely to adopt increasing block rate structures than private, I find strong evidence in support. As expected, public utilities are far more likely to adopt progressive rates. The effect is both statistically significant at the .05 level and highly substantively significant. With all

other variables in the model at their means, private utilities are 17.1 percent less likely to adopt increasing block rates than their public counterparts.

With H2 I posited that utilities in drier areas would be more likely to adopt increasing block rates. The results provide strong support for this hypothesis. Indeed, area moisture is by far the largest predictor of progressive rates. The W-F moisture index had a strong negative and significant effect on progressive rate adoption. Figure 4 shows the predicted probability of increasing block rate adoption across the range of moisture. As can be seen, in the driest of areas, utilities are almost certain to adopt progressive rates, while they are far less likely to adopt them in moister regions. A move from one standard deviation above mean moisture to one standard deviation below the mean results in a 63 percent increase in the predicted probability of adoption.

Figure 4. Effect of moisture on increasing block rate adoption.

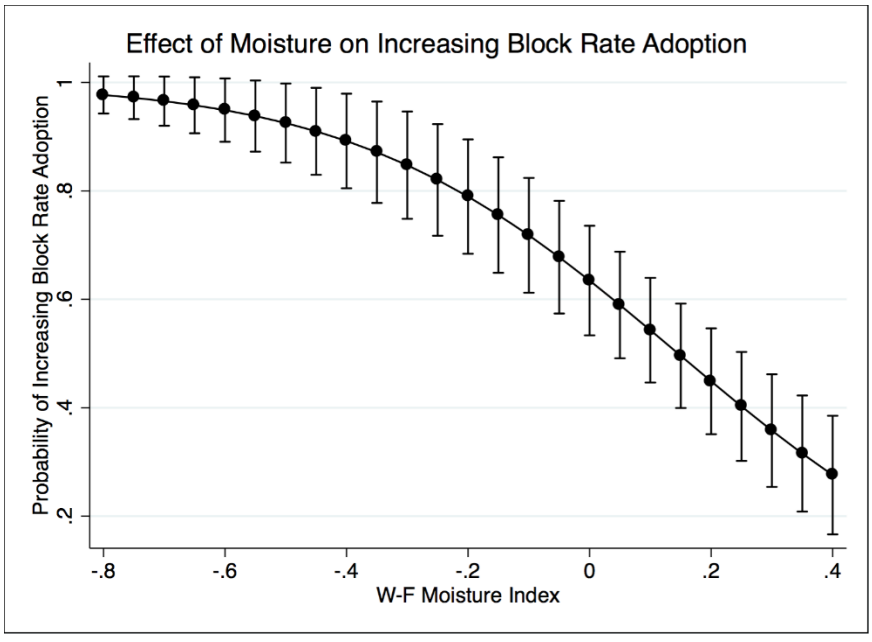
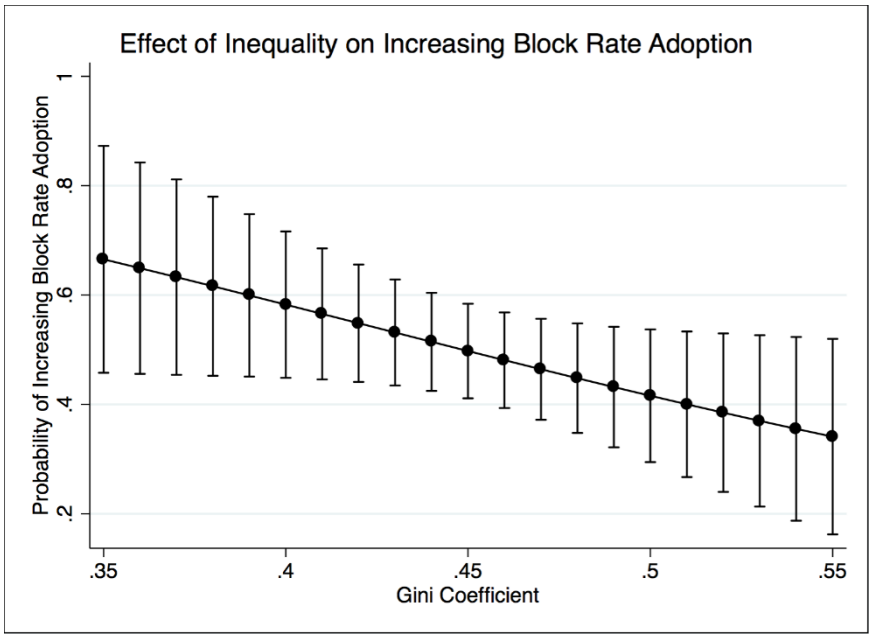


Figure 5. Effect of inequality on increasing block rate adoption.

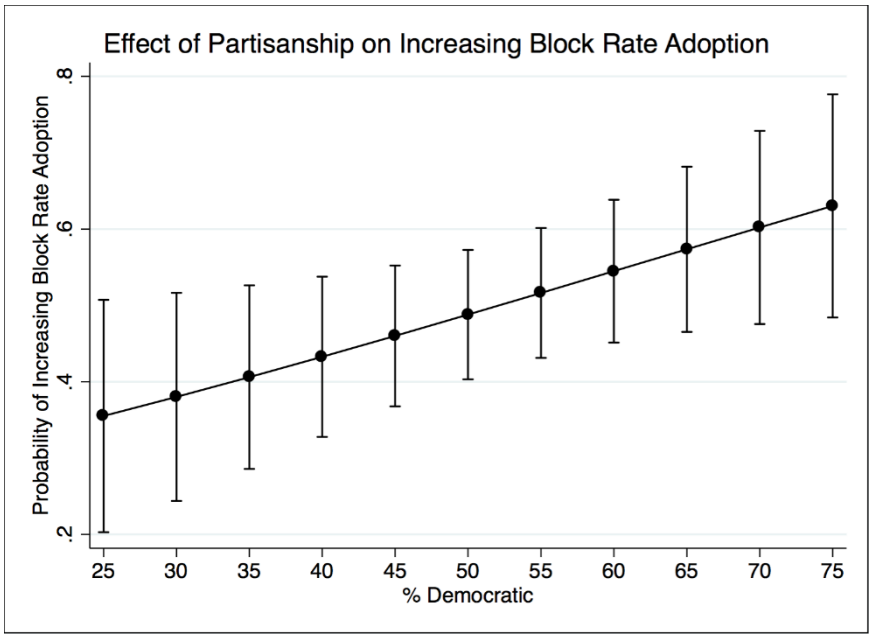


For the effect of inequality on rate adoption I discussed two competing hypotheses. First, I suggested that since increasing block rates have redistributive implications, increasing inequality would increase their necessity. The relationship between inequality and redistribution was the logic behind H3A, which suggested higher inequality would lead to a higher probability of progressive rate adoption. The other possibility was also considered. Because powerful minorities tend to wield influence in local government, H3B suggests that greater inequality may actually make utilities less likely to adopt increasing block rates. Indeed, while the effect size is relatively modest and the effect is only significant at .10 level, there is evidence for H3B over H3A. Higher inequality leads to a lower probability of increasing block rates. Figure 5 shows the predicted probability of rate adoption across the range of the gini coefficient,

representing income inequality. A two standard deviation increase in income inequality, moving from one standard deviation below the mean, results in a predicted 15 percent decrease in the probability of progressive rate adoption.

The final non-interactive hypothesis, H4, suggested that utilities in more liberal areas would be more likely to adopt progressive rates. Model (1) shows strong support for this hypothesis, with utilities in areas that had a higher democratic percentage of the major party vote being more likely to adopt increasing block rates. This finding can be seen in Figure 6, which shows the predicted probability of increasing block rate adoption across values of democratic share of the major party vote. Moving from one standard deviation below the mean democratic share to one standard deviation above leads to an 18 percent increase in the probability of progressive rate adoption.

Figure 6. Effect of partisanship on increasing block rate adoption.



While the non-interactive model affirmed that private utilities are in general less likely to adopt increasing block rates, of interest here is also whether they are less responsive to local citizens. Model (2) shows the results of the interactive model that tests whether moisture, inequality, and partisanship have a greater effect on private utility rate setting than public. Surprisingly, none of the interaction terms were significant at conventional levels, suggesting that the effects of the contextual variables were not statistically different between public and private utilities. This means there is little support for H5-H7, which posited that the effects of moisture, inequality, and liberalism would be greater for public utilities than private.

Table 7: Marginal Effect of IV's for Public and Private Utilities

	% Moisture			Gini Coef.			% Dem		
	M.E.	Std. Error	p-value	M.E.	Std. Error	p-value	M.E.	Std. Error	p-value
Public Utilities	-0.724	(0.141)	<.001	-1.648	(1.044)	.114	.005	(.003)	.091
Private Utilities	-0.653	(0.208)	.002	-1.860	(0.855)	.029	.014	(.001)	<.001

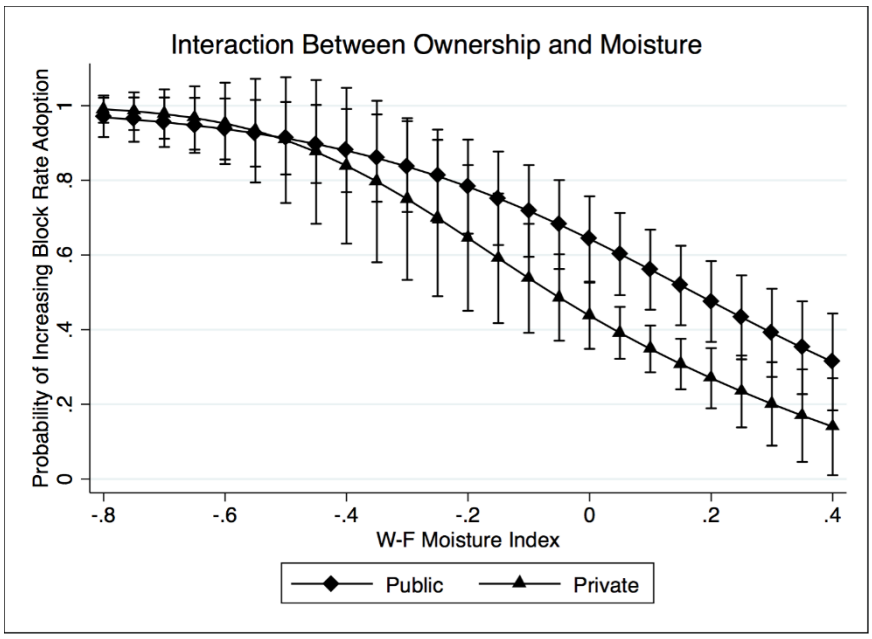
Note: All other variables at means.

Still, while the interactions are not significant at conventional levels, it is worth exploring the effects from a substantive perspective. The marginal effects of each of the three variables for public and private utilities can be seen in Table 7, while the predicted probabilities can be seen in Figures 7-9.

As can be seen in the first column of Table 7 and in Figure 7, the effect of moisture is slightly larger for public than private, but the difference seems to present itself in moister areas rather than drier. At low levels of moisture that public utilities are statistically more likely to adopt progressive rates, while in extremely dry areas there is no

statistically distinguishable difference between public and private utilities. What is most interesting about these models is that moisture has a large effect on the behavior of private and public utilities. Regardless of ownership, when it comes to utility adoption of increasing block rates, area climate is a crucial factor. Both private and public utilities appear to be responsive. There is little support for H4.

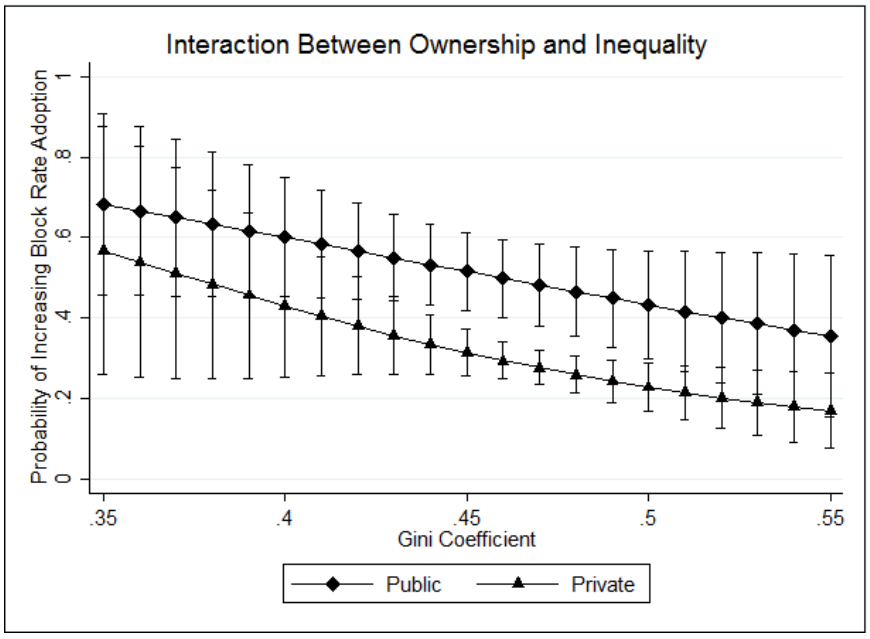
Figure 7. Interaction between ownership and moisture.



Inequality also has similar effects for public and private utilities. Interestingly, although the effects are not statistically distinguishable from each other, the effect is slightly larger for private utilities. This means when a utility is privately owned, increasing income inequality makes them even less likely to adopt conservation rates.

Still, the effect of inequality is negative and nearing significance regardless of ownership. There is very little support for H5, and inequality actually has a larger impact for private utility rate adoption than public, although the difference is not statistically significant.

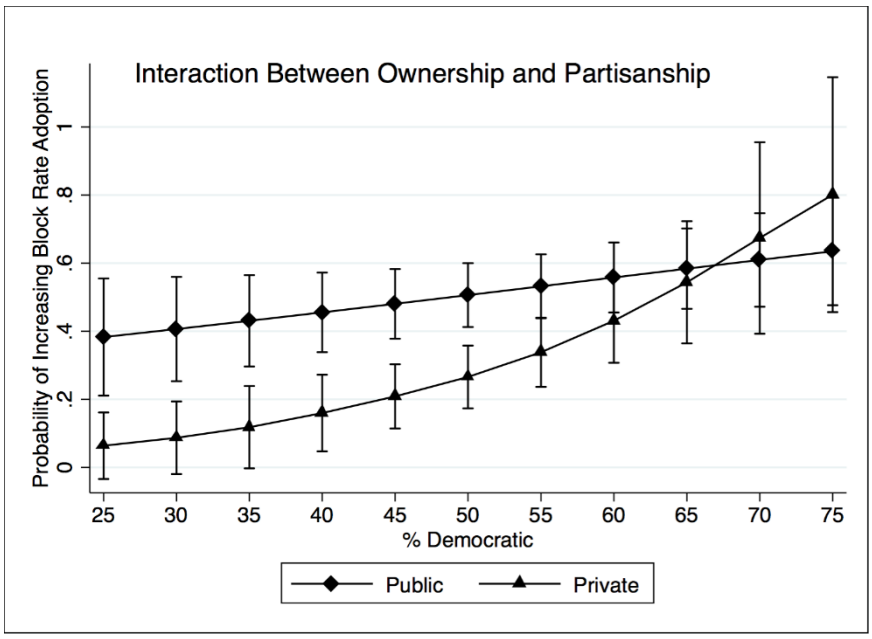
Figure 8. Interaction between ownership and inequality.



The most interesting results are for partisanship. While H7 suggested that citizen liberalism would have a greater effect on public adoption of progressive rates than private, there is little evidence of this at all. Indeed, much like the results for inequality, any difference actually tends in favor of private utilities being impacted more by partisanship. Figure 9 shows that while in low Democratic areas public utilities are more likely to adopt progressive rate structures than public, this difference goes away as

democratic partisanship increases. Partisanship has an effect for both ownership types, but the effect is larger for private utilities, although these effects are again statistically indistinguishable. Still, there is little evidence in these models to suggest that citizen partisanship has a greater effect on public utilities than private, and any evidence at all is actually for the opposite phenomena.

Figure 9. Interaction between ownership and partisanship.



Discussion

The most important finding in the analysis is the confirmation in model (1) that private utilities are less likely to adopt increasing block rates. As mentioned, there is little independent reason for private utilities to adopt increasing block rates, while they should be a median customer preference. The results show that in the aggregate, public

utilities may be more responsive to the median customer, even if both public and private are responsive to local conditions and citizen preferences.

Additionally, the non-interactive model holds interesting results for rate setting in general. First, it affirms the finding of previous studies that climate is perhaps the most important factor in the adoption of rate structures. In relatively wet areas, utilities are unlikely to adopt increasing block rate structures. In dry areas, they are exceedingly likely to do so. More novel are the findings for inequality and partisanship. To my knowledge, no study has explored the effect of these variables on rate structures, although they are clearly important factors. The result for inequality shows that despite the fact that increasing block rates should be a median voter position, it is often the case that in local government powerful minorities determine policy. Higher levels of inequality should increase the need for progressive rates, since they tend to be more equitable (Teodoro 2005). In fact, I found the opposite. As income inequality increases, the probability of increasing block rate adoption decreases. The study is also the first to consider the effect of local partisanship on rate setting. As expected, utilities serving populations with a higher percentage of democratic voters were more likely to adopt progressive rates.

The findings from the interactive model, although not supporting the stated hypotheses, are quite interesting as well. While I expected that local context would have a greater effect on public rate structures, the results suggested that context influences both public and private utilities. That context equally influences private and public utilities perhaps speaks to the role of the public utility commissions, especially when it

comes to the effect of moisture. Indeed, in the driest of areas, there was no statistical difference between public and private utilities, potentially suggesting that public utility commissions play an important role in conservation. Since the commissions are highly professionalized agencies, it is likely that those in states with water resource issues recognize the importance of increasing block rates and encourage their adoption. While the analysis here cannot show the direct influence of commissions on private rate setting, that public and private utilities are equally influenced by local moisture levels points to this possibility. The results for inequality and partisanship have less clear explanations, although state level politics may play a role.

Conclusion

The results here hold important implications for privatization in the United States. In affirming that public utilities are more likely to adopt increasing block rates, I would suggest that some of the concerns of anti-privatization critics might be correct. Increasing block rates benefit the majority of customers, help conserve water, and are generally recognized as important (Levin et al. 2002). That private utilities are less likely to adopt these rates is concerning from an environmental perspective as well as an equity perspective. It is possible that privatization could lead to less equitable utility rates and less water conservation.

Still, that private utilities appear to be as responsive to local climate conditions and partisanship suggests that some concerns are perhaps overstated. The regulation of private utility rate structures may mean that they are responsive to customer and societal needs, even if their independent incentives mean they shouldn't be. Indeed, in the areas

where environmental concerns would be the greatest, drier regions, public utilities are no more likely to adopt increasing block rates than private. That private and public utilities respond similarly to climate does not mean concerns about a loss of local democratic control in privatization are unfounded, but it does not appear from this analysis that private utilities are less responsive to local conditions when it comes to adopting increasing block rates.

The analyses here also open up a number of interesting extensions. First, that the contextual variables had an effect on both private and public utilities is indicative of the large role played by public utility commissions in private rate structure adoption. Since these are state agencies, understanding the state level variables that influence rate adoption is an important next step. Additionally, while the study currently only considers increasing block rates, it is possible to include data on other rate structures as well. Decreasing block rate structures are especially interesting, since they are purposefully regressive and anti-water conservation, encouraging higher volume consumers to consume even more, since the price per unit decreases at higher volumes. Finally, this paper is the first to explore the roles that local partisanship and inequality play in rate setting. The interesting results here suggest there is much more work to be done.

CHAPTER V

CONCLUSION

In this dissertation I have attempted to explore the topic of drinking water privatization in the United States in a normative and empirical way, specifically exploring the implications of privatization for local democracy. Throughout my analyses, a number of consistent themes emerged. First, the investigation into water privatization reveals the important role of the regulatory state in drinking water policy. Second, my research has shown that it is crucial to understand privatization in political context. Finally, this work has demonstrated a potential dark side to political accountability.

Regulation

One of the most important takeaways from this exploration into the implications of water utility privatization in the United States is the crucial role of the regulatory state in holding private utilities accountable. The analyses in this dissertation show that in the United States there is little reason to believe that private utilities will do a worse job than public in protecting the public health, and while private utilities are slightly less likely to adopt conservation oriented rates in general, in the areas where conservation matters most private utilities are not all that different from public utilities in rate structures. Crucially, this is because in the United States private utilities are accountable to political authorities: specifically, state environmental agencies and public utility commissions. The normative and empirical analyses in this dissertation point to the vital role of

regulation on the performance and acceptability of private utilities. Indeed, from almost any perspective, the acceptability of privatization is tethered to the existence of a robust regulatory state.

In Chapter II I discussed some of the common arguments against privatization, arguing that many of them are perhaps overstated with the presence of regulation. I first discussed the implications of a human right to water for private water utilities. As mentioned, many anti-privatization critics and movements have used a human rights framework as the basis for opposition (Bakker 2010; Barlow and Clarke 2002). The analysis in Chapter II suggests, however, that from a human rights perspective, the right to drinking water does not necessarily entail a right to public delivery of water (or the prohibition on the private delivery of water). Rather, I concluded that the existence of a human right to water would only require that states ensure all citizens have access to safe water for drinking and sanitation at an affordable price. This right does not require the state itself to provide the water (Risse 2014; Williams 2007). This means that there is no absolute incompatibility between a human right to water and privatization, as many argue. Instead, the human right to water only creates a state duty for regulation. Since nations are required to make sure all citizens receive safe water at affordable price, the human right to water means they have to ensure that the providers of water meet these basic needs. In this sense, the human right to water only allows privatization in the presence of a strong regulatory state. Where regulatory bodies do not exist, privatization means there is no way to ensure the human right to water.

My evaluation of the implications of privatization for utility outcomes related to accountability followed a similar logic. While critics of privatization are concerned with the potential negative effects on pricing, water quality, and conservation, these criticisms are perhaps overstated in the presence of regulation, as is the case in the United States. While private utilities do on average charge higher rates for water (Food and Water Watch 2016; CBO 1982; Levin et al. 2002), cost of service ratemaking means that they have to balance consumer and investor interests (Breyer 1982). Public utility commissions in the United States keep private utilities from charging customers excessive amounts. Regulation also has crucial implications for the quality of water. The existence of environmental regulation at the state level also means that private utilities are constrained in their provision of drinking water. Additionally, the rate setting at regulatory commissions encourages private investment in infrastructure. Public utility commissions also may require policies at the utility level that encourage conservation. In general, these arguments suggest that there is little reason to believe that private utilities will lead to unequivocally worse outcomes for citizens. Once again, however, this is conditional on the presence of the regulatory state. Without accountability to regulatory agencies, it is likely that private utilities would be incentivized to charge extremely high rates, cut costs when it comes to the protection of public health, and not adopt conservation policy.

The two empirical chapters also reveal the important nature of regulation for the acceptability of private water utilities. As discussed in Chapter III, there are good reasons to expect that private utilities will provide higher service quality than public.

This is largely due to the differing incentives facing public and private utilities, which come from differences in regulation and accountability. Because private utilities are subject to public utility commissions in rate setting, they are actually incentivized to invest in infrastructure. The limit on profits by public utility commissions means that rather than being incentivized to cut costs while raising prices, private utilities are instead incentivized to build reinvestment into their rates, making compliance with the SDWA more likely. In addition to this, the ability of state regulatory agencies to sanction poor performing private utilities more successfully than public utilities means that private utilities have even greater incentive to protect the public health.

To be clear, the incentives described have little to do with ownership or even management. Private utilities do not outperform public utilities because private management leads to better managerial practices, or because market mechanisms inevitably lead to higher efficiency. Rather, the incentives that allow for private utilities to protect the public health are due primarily to the existence of the regulatory state. Without the existence of strong regulation, it is unlikely that the non-interactive finding of superior private performance would exist. It is primarily because of the accountability mechanisms of regulation that privatization is acceptable from a public health perspective.

Chapter IV also showed that regulation may mean the privatization of utilities does not necessarily lead to lower responsiveness when it comes to rate structures. As I showed, while private utilities were generally less likely to adopt increasing block rate pricing structures, they were no less responsive to citizen partisanship, inequality, or

local climate conditions. Most importantly, where increasing block rate pricing is most necessary, in dry conditions, there was no statistically significant difference between public and private utilities. Again, this does not mean that there should be no concern about the privatization of water utilities, but rather suggests the crucial role of public utility commissions in regulating them. Public utility commissions in drier states likely recognize the needs of the localities they are responsible for protecting, and ensure that private utilities include conservation considerations in their rate structures.

In general, this work shows how important the regulatory state is for constraining private interests in public service provision. That private utilities are able to protect the public health and the environment adequately is not because their interests are inherently aligned with the public. Rather, it is because they are largely accountable to political institutions in their decision-making and performance. One of the primary justifications for regulation, according to Breyer (1982), is the control of monopoly power. Without the mechanisms of the free market to constrain behavior, natural monopolies will cut costs and raise prices. These incentives means what is produced will be more expensive and of lower quality. Without regulation, these incentives would certainly exist in the private utility industry. Any reasonable argument for privatization must not be an argument for less public accountability and authority; rather, the two go hand in hand. Privatization is only acceptable from a human rights perspective, from a public health perspective, and a conservation perspective when accompanied by a robust regulatory regime.

Privatization in Political Context

A second major theme that emerged throughout this dissertation is the possibility that ownership of water utilities is less important than political venues of accountability. Importantly, the combination between venues of political accountability and political context are extremely important for the evaluation of utility privatization. As discussed in the introduction, one of the major goals in this dissertation was to defuse the debate surrounding the privatization of water utilities. Indeed, to this point, much of the work on the issue has been done by privatization critics, who too often present a one sided view of the issue. Often, privatization is presented as a black and white issue, where privatization represents a neoliberal takeover of resources unconstrained by public concern (Barlow and Clarke 2002; Arnold 2005; Athlers 2010; Subramaniam and Williford 2012).

In contrast to the often contentious literature on water privatization, I have decided to take a different approach here. The major question for me to answer in this dissertation wasn't whether privatization of water utilities in the United States is inherently good or bad, but rather to explore what the normative and empirical implications of privatization are, and specifically explore its implications for democracy. Crucial to this goal was exploring privatization as a contextual phenomenon rather than a binary one. Utility privatization has different implications depending on where it occurs, and a critical goal of the dissertation was to understand how the incentives facing public and private utilities differ depending on their context. Throughout my analysis, what emerged was the idea that we must examine privatization in political context.

Understanding what political authorities public and private utilities are accountable to and how those different venues of political accountability change expectation for privatization in different contexts.

Central to this goal is understanding that the relevant variable, at least in the United States, is perhaps not ownership. As identified by Bozeman (1987), all organizations are public to some extent. For Bozeman, the relative "publicness" of an organization is determined by its level of accountability to political authorities, and not by its ownership. A publically owned organization may actually be less "public" than a privately owned one if it is less accountable to political processes (Bozeman 1987). In this way, sectoral ownership does not matter as much as political accountability. In this dissertation, I have suggested that it is not ownership, or even "publicness," that is the key difference between public and private utilities in the United States. Both types of utilities are greatly accountable to political authorities. Private utilities are accountable to public utility commissions in the setting of rates and accountable to state and federal agencies for drinking water quality. Public utilities are held accountable by the local governments that own and operate them, and are additionally regulated for water quality by environmental agencies. I argue that since both are highly accountable to political authority, the relevant distinction to make is actually in the political venues that they operate in, and in the incentives that these different venues create.

What is crucial is that privatization leads to a centralization of political authority over drinking water resources. Essentially, this entails a shift in political accountability from the city council chambers to the state capital. While this is potentially concerning

from a normative perspective, as my discussion of Tocqueville and Mill highlighted, it is crucial to understand that a shift in the venue of accountability does not mean a lack of accountability. It can certainly be argued that private utilities are not as democratically accountable to the citizens they serve, but it would be difficult to make the case that they are not accountable at all.

Critically, these different venues of political accountability mean that context should have a large role in the relative performance and decision making of private and public utilities. In Chapter III, I explored how this could be the case with respect to drinking water quality. I found that public utilities, due to their connection to local political processes, were more responsive to local voter turnout than private utilities. I found that voter turnout had a strong and significant effect on the number of violations committed by municipal utilities, with utilities in higher turnout areas committing far fewer violations of the SDWA than those in low turnout areas. Crucially, turnout did not have a statistically significant effect on the number of violations committed by private utilities.

The results for Chapter IV were less clear. While public utilities were more likely to adopt increasing block rate pricing overall, which following Mullin (2008), I argued was a median voter preference, I did not find that public and private utilities greatly differed in their responsiveness to local conditions. Moisture levels, inequality, and citizen partisanship all had similar effects on rate adoption for public and private utilities. Most importantly, where increasing block rates are most necessary, in the driest

of regions, private and public utilities are equally likely to have increasing block rate pricing structures.

Regardless of the empirical results, the conceptual argument is still important. Rather than focus on ownership as the key variable of distinction between private and public utilities, it may be more fruitful to think about venues of political accountability.

The Dark Side of Local Accountability

Another theme that emerged throughout the dissertation is the possibility of a dark side of local accountability. Most of the literature on utility privatization to this point has focused on local control as an unequivocally good thing (Robinson 2013; Bakker 2010; Barlow and Clarke 2002). My understanding of the implications of Tocqueville and Mill for utility privatization would lead to a similar conclusion. This idea, that localities should control that which is of primary concern to them, is a powerful one. The analysis here shows, however, that local control may not always lead to desirable outcomes. Indeed, there appears to be a dark side to local control of water utilities, where the fact that public utilities are accountable to local demands lead to negative outcomes for citizens.

The first indication of the dark side of local accountability is in pricing. Studies have noted that private utilities charge significantly higher for drinking water than public, but critics are often mistaken as to why this is the case. While public utility commissions regulate the rates of private utilities in order to balance consumer and investor needs, public utilities face incentives that often lead to charging below cost (Levin et al. 2002). The electoral incentives of local politicians mean they will favor

short term benefits over long term investments, meaning rates will be held low in the near term at the expense of infrastructure investment. While private utilities can build reasonable reinvestments in infrastructure into their pricing structures, public utilities charging below cost may struggle to pay for necessary updates to technologies and existing infrastructure. This is not a benign issue. Indeed, that public utilities often charge below cost likely explains a great deal of the difference in regulatory compliance between private and public utilities (Konisky and Teodoro 2016).

Chapter IV also pointed to a potential dark side of local accountability. The finding for income inequality, which was that greater levels of inequality leads to a lower probability of increasing block rate adoption point to a scenario in which powered interests may actually wield a disproportionate amount of power in local governance of drinking water resources. Increasing block rate pricing is considered a progressive redistributive rate structure. That they are less likely in communities with higher levels of inequality is concerning from an equity perspective. It is in these communities that redistribution is most important, and yet they are less likely to adopt redistributive rates. This raises a further question, which is when public utilities are accountable, who are they accountable to? Schattschneider (1960) long ago pointed out that "The flaw in the pluralist heaven is that the heavenly chorus sings with a strong upper-class accent. (35)" Given the finding for inequality, it appears that this may be the case in local water policy.

Perhaps the strongest evidence for the dark side of local accountability is in Chapter III. The results of the SDWA analysis call into question what happens when a

public is not engaged. Konisky and Teodoro (2016) have pointed out that government often struggles to regulate government. My counter in Chapter III was that when citizens are engaged, they may be able to self-regulate their local governments. Unstated, but extremely concerning, is what occurs when neither government nor citizens can regulate government. The results of Chapter III suggest that when citizens are not engaged, local governments that own and operate utilities are not held accountable for poor performance. At lower levels of citizen turnout, the compliance rates of municipal utilities were extremely poor. These findings suggests that local accountability to citizens is only a good thing when citizens are politically engaged. Where citizens are not politically engaged, or where the accountability of local governments to citizens is low, government performance may suffer.

While Chapter III revealed how low levels of citizen engagement may threaten utility performance, a couple of recent cases show what can occur when there are no government accountability mechanisms. The case of Flint, Michigan shows what can occur when the connection between citizens and the governance of water is severed. Under the Michigan emergency manager law, Flint was assigned a series of emergency city managers from 2011 to 2015 (Bliss 2016). Under Governor Rick Snyder, Michigan implemented a law that greatly expanded the ability of the state government to install emergency managers for cities struggling with solvency. Interestingly, the signing of the law actually was somewhat anti-democratic, since voters rejected the law by referendum in 2012, before a similar version was passed one month later (Bliss 2016). The effects of the law on local democracy in Flint were far worse. The emergency city managers were

not appointed through local political processes, but rather placed in charge by the state government with the goal of reducing the financial issues plaguing the city. Consequently, the individuals in charge of Flint's affairs were not accountable to the people of Flint. As a cost cutting move, the emergency manager in charge of Flint's water system decided to switch the source of water from the Detroit water system to the Flint River in 2014. What followed was a lead poisoning crisis that gained national attention. Importantly, during the time between the switch to the Flint River and the discovery of the lead issue, many citizen complaints were ignored by the government (Bliss 2016). While many other factors can help explain the lead crisis, the severing of the accountability bonds between citizens and their local government played a large role in the tragedy that followed.

Far less covered than the crisis in Flint were the events that transpired in Crystal City, Texas in February 2016. In January of 2016, a city council member of Crystal City was arrested on human smuggling charges (KSAT 2016). Less than a month later, on February 4, all but one of the remaining city council members were arrested on Federal bribery charges, along with the city manager. Essentially, almost the entire city leadership was indicted for some form of crime (Spicer 2016). City business ground to a halt, and on February 17 a city council meeting was held with only the single council member attending, and no quorum to make any important decisions (Brnger 2016a). One day later, the water and wastewater department made the decision to clean out the water tower. Sediment was flushed into the distribution lines, and citizens were shocked to find black sludge like water emerging from their faucets (Brnger 2016b). Asked why citizens

were not informed, the Superintendent suggested that he didn't expect the sediment would enter the distribution (Brnger 2016b). While the problems in Crystal City were not near the scale of those in Flint, they also point to what can potentially occur when local government becomes unaccountable to the citizens they serve.

The situations in Flint and Crystal City show some of the potential issues when local accountability is so important for positive outcomes. When that accountability is severed, water can run black and children can be poisoned.

One interesting implication of the dark side of local accountability is that it may be desirable to increase the regulatory tools available for regulating local governments. First, this means increasing regulatory punishments. The possibility of higher regulatory punishments for public utilities is a clear implication of Konisky and Teodoro's (2016) work. Perhaps more importantly, although far more unlikely, an increased regulation of public utilities may also mean that public utility commissions should regulate public rate setting in addition to private, but with a very different goal than the regulation of private rates. While utility commissions must make sure to keep private rates down to a point where they are affordable, it may be the case that they should ensure that public rates are being raised appropriately. That public utilities commit more violations of the SDWA is likely related to the fact that most public utilities actually charge below cost for their distribution of drinking water. Regulation with the goal of ensuring sufficient revenues would mean public utilities would have to justify to state public utility commissions their reasons for keeping rates low. The opposite logic of regulation would apply.

Interestingly, while this would likely not accord with Tocqueville's vision of local government, it could fit well with Mill's ideas of the relationship between centralized government and localities. While Mill certainly argues that those things that are particular to local governments should be controlled by local governments, he grants that centralized authorities may be necessary for broader knowledge. While the particulars are best left to the local governments, the knowledge of the centralized government is not only useful, but necessary.

Future Directions for Research

This dissertation is an important first step in exploring the implications of utility privatization in the United States, but there is much more work still to be done. I only explored a few of the important potential differences between public and private utilities, focusing primarily on responsiveness. But responsiveness to citizens is not the only important way that utilities can differ across sectors. One other potential difference to explore is in the effect of human capital in the labor market on public and private utility performance. My recent research has found a strong and significant relationship between labor market human capital availability and utility compliance with the SDWA (Teodoro and Switzer 2016; Switzer, Teodoro, Karasik 2016). This research showed that utilities that have access to educated labor pools have much higher levels of compliance with the SDWA than those in areas with low levels of education. Importantly, the logic that leads to this result does not necessarily apply to many private utilities. Private utilities are often parts of large corporations with deep pockets and significant pools of human capital within the organization. While it is relatively difficult for a public utility in a

human capital poor area to bring in qualified individuals capable for properly running a utility, this is less of a problem for large corporations that have networks of human capital across the country that they can make use of.

An additional area of exploration is in the implications of privatization for environmental justice. My recent work outside of the dissertation has shown that public utilities that serve poor and minority communities are far more likely to commit violations of the SDWA (Switzer and Teodoro forthcoming). The relationship between socioeconomic status and race and ethnicity is actually interactive, with utilities that serve black and Hispanic communities performing especially poorly in the most impoverished of communities. One potential theoretical rational for this finding is that poor communities may lack to ability for collective action to combat racial and ethnic biases. Because local governments are responsive to the incentives they face from their citizens, the inability to mobilize means local governments providing poor water may not be politically punished in these communities. As discussed in great detail, private utilities face far different incentives when it comes to the provision of drinking water. It is possible that these differing incentives may mitigate environmental injustice.

In addition to other quantitative analyses that could be done, it will be useful to take a qualitative approach to the topic of privatization as well. Case studies examining utilities like those in Claremont, CA, Missoula, MT, and Atlanta, GA, show some of the variety in outcomes that can result in private ownership, while cities like San Antonio, TX and Denver, CO may shed more theoretical light on the positive side of citizen

participation. Cases like Flint and Crystal City may provide compelling qualitative data on public failures in drinking water governance.

The Desirability of Private Utilities in the United States

It is now time to come to some final conclusions on the case of privatization in the United States. Unfortunately, the reality of attempting to understand the context specific nuance of an issue means clean answers are unlikely, and that is certainly the case here. None of the evidence above definitely suggests that privatization is all good or all bad. Rather, it points to the fact that the desirability of privatization depends on a number of contextual factors.

The first thing to note is that privatization does not seem to be so undesirable, with a crucial caveat. Drinking water privatization seems to be acceptable in the presence of a strong regulatory state. With regulation in place, private utilities are able to keep prices relatively affordable, make sure the drinking water is safe, and when necessary, adopt rates that are conservation oriented. All of this seems to suggest that privatization is acceptable in many cases.

Crucially though, the results of the analysis don't point to the idea of privatizing everywhere. Public utilities are more likely to adopt conservation rates in general, and as likely in areas of extreme need. More importantly, when citizen turnout is high, public utilities appear to protect the public health equally well. In areas with high levels of citizen participation, the regulatory gap between public and private utilities shrinks.

The purely empirical implications of this would suggest a context specific need for privatization. In areas where citizen participation is low, it makes sense from a public

health perspective to privatize utilities. Where citizen participation is high, however, this is not as necessary. These implications show why it is important to consider the normative side of political investigations. This type of approach would mean that citizens in areas with low levels of participation would actually have their future ability to participate in drinking water governance taken away. As discussed, privatization under regulation is really a form of centralization. Privatization in these cases would mean taking local control of drinking water away from those who are already underrepresented in American politics. As the literature in political science has made clear, citizen participation is highly correlated with socioeconomic status, race, and ethnicity (Leighley and Vedlitz 1999; Brady, Verba, and Schlozman 1995). While providing safer drinking water is certainly desirable, we must be careful to not imperil marginalized communities abilities for self-determination. Tocqueville and Mill show the importance of local government in providing opportunities for political education. And if citizens cannot be responsible for something as vital as drinking water, why should they have local control at all? Privatization may not threaten the health of United States citizens, but it may threaten their political role as citizens.

REFERENCES

Ansolabehere, Stephen, and Jonathan Rodden. 2011. Harvard Election Data Archive.

Arnold, Craig Anthony. 2005. "Privatization of Public Water Services: The States' Role in Ensuring Public Accountability." *Pepperdine Law Review* 32(3): 561-604.

Athlers, Rhodante. 2010. "Fixing and Nixing: The Politics of Water Privatization." *Review of Radical Political Economies* 42(2): 213-230.

Averch, Harvey, and Leland L. Johnson. 1962. "Behavior of the Firm under Regulatory Constraint." *The American Economic Review* 52(5): 1052-1069.

Bakker, Karen J. 2000. "Privatizing Water: Producing Scarcity: The Yorkshire Drought of 1995." *Economic Geography* 76(1): 4-27.

Bakker, Karen J. 2005. "Neoliberalizing Nature? Market Environmentalism in Water Supply in England and Wales." *Annals of the Association of American Geographers* 95(3): 542-565.

Bakker, Karen. 2010. *Privatizing Water: Governance Failure and the World's Urban Water Crisis.* Ithica: Cornell University Press.

Baldwin, J. Norman. 1990. "Perceptions of Public versus Private Sector Personnel and Informal Red Tape: Their Impact on Motivation." *The American Review of Public Administration* 20(1): 7-28.

Barlow, Maude, and Tony Clarke. 2002. *Blue Gold: The Fight to Stop the Corporate Theft of the World's Water.* New York: The New Press.

Bel, Germa, and Mildred Warner. 2008a. "Challenging Issues in Local Privatization." *Environmental Planning C: Government and Policy* 26: 104-109.

Bel, Germa, and Mildred Warner. 2008b. "Does Privatization of Solid Waste and Water Services Reduce Costs? A Review of Empirical Studies." *Resources, Conservation, and Recycling* 52: 1337-1348.

Bel, Germa, Xavier Fageda, and Mildred E. Warner. 2010. "Is Private Production of Public Services Cheaper Than Public Production? A Meta-Regression Analysis of Solid Waste and Water Services." *Journal of Policy Analysis and Management* 29(3): 553-577.

Berry, William D. 1979. "Utility Regulation in the States: The Policy Effects of Professionalism and Salience to the Consumer." *The American Journal of Political Science* 23(2): 263-277.

Bliss, Laura. 2016. "How Democracy Died in Flint." *CityLab*. Available at: http://www.citylab.com/politics/2016/02/flint-water-crisis-democracy-failure/459825/ (Accessed: February 16, 2017).

Boyne, Geoge A. 2002. "Public and Private Management: What's the Difference?" *Journal of Management Studies* 39(1): 97-122.

Bozeman, Barry. 1987. *All Organizations are Public: Comparing Public and Private Organizations*. Washington D.C.: Beard Books.

Brady, Henry E., Sidney Verba, and Kay Lehman Schlozman. 1995. "Beyond SES: A Resource Model of Political Participation." *American Political Science Review* 89(2): 271-294.

Breyer, Stephen. 1982. *Regulation and its Reform*. Cambridge: Harvard University Press.

Brnger, Garrett. 2016a. "Standstill in Crystal City: Lack of Quorum Leaves Important Items Unresolved." *KSAT*. Available at: http://www.ksat.com/news/standstill-in-crystal-city-lack-of-quorum-leaves-important-items-unresolved (Accessed: February 16, 2017).

Brnger, Garrett. 2016b. "Trust Runs Thin as Black Water Flows in Crystal City." *KSAT*. Available at: http://www.ksat.com/news/black-water-flows-from-faucets-in-crystal-city (Accessed: February 16, 2017).

Bullock, Justin B., Justin M. Stritch, and Hal G. Rainey. 2015. "International Comparison of Public and Private Employees' Work Motives, Attitudes, and Perceived Rewards." *Public Administration Review* 75(3): 479-489.

Cahill, Amanda. 2005. "'The Human Right to Water- A Right of Unique Status': The Legal Status and Normative Content of the Right to Water." *International Journal of Human Rights* 9(3): 389-410.

Campbell, Heather E. 1996. "The Politics of Requesting: Strategic Behavior and Public Utility Regulation." *Journal of Policy Analysis and Management* 15(3): 395-423.

Congressional Budget Office. 1982. *Financing Municipal Water Supply Systems*. Washington D.C.: The Congress of the United States Congressional Budget Office.

Chess, Caron, and Kristen Purcell. 1999. “Public Participation and the Environment: Do we know what Works?” *Environmental Science and Technology* 33(16): 2685-2692.

Chestnutt, Thomas W., Janice A. Beecher, Patrick C. Mann, Don M. Clark, W. Michael Hanemann, George A. Raftelis, Casey N. McSpadden, David M. Pekelney, John Christianson, and Richard Krop. 1997. *Designing, Evaluation, and Implementing Conservation Rate Structures*. Sacramento: California Urban Water Conservation Council.

Cimitile, Carole J., Victoria S. Kennedy, W. Henry Lambright, Rosemary O’Leary, and Paul Weiland. 1997. “Balancing Risk and Finance: The Challenge of Implementing Unfunded Environmental Mandates.” *Public Administration Review* 57(1): 63-74.

City of Claremont vs. Golden State Water Company. 2016. Superior Court of the State of California for the County of Los Angeles.

ClaremontFLOW. 2017. “ClaremontFLOW.” Available at: http://www.claremontflow.org/ (Accessed: February 16, 2017).

Coursey, David, and Barry Bozeman. 1990. “Decision Making in Public and Private Organizations: A Test of Alternative Concepts of Publicness.” *Public Administration Review* 89(2): 271-294.

Daley, Dorothy M. 2007. “Citizen Groups and Scientific Decisionmaking: Does Public Participation Influence Environmental Outcomes.” *Journal of Policy Analysis and Management* 26(2): 349-368.

Davis, Jennifer. 2005. “Private-Sector Participation in the Water and Sanitation Sector.” *Annual Review of Environmental Resources* 30: 145-183.

Dilworth, Richardson. 2007. “Privatization, the World Water Crisis, and the Social Contract.” *PS: Political Science and Politics* 40(1): 49-54.

Dixit, Avanash. 1997. “Power of Incentives in Private Versus Public Organizations.” *The American Economic Review* 87(2): 378-382.

Dobson, Andrew. 1996. “Democratising Green Theory: Preconditions and Principles.” In *Democracy & Green Political Thought: Sustainability, Rights, and Citizenship*. Editors Brian Doherty and Marius de Geus. London: Routledge: 132-148.

Durant, Robert F. 1985. *When Government Regulates Itself*. Knoxville: University of Tennessee Press.

Eckersley, Robyn. 1996. "Greening Liberal Democracy: The Rights Discourse Revisited." In *Democracy & Green Political Thought: Sustainability, Rights, and Citizenship*. Editors Brian Doherty and Marius de Geus. London: Routledge: 212-236.

Fauconnier, Isabelle. 1999. "The Privatization of Residential Water Supply and Sanitation Services: Social Equity Issues in the California and International Contexts." *Berkeley Planning Journal* 12(1): 37-73.

Feldman, Martha S., and Anne M. Khademian. 2007. "The Role of the Public Manager in Inclusion: Creating Communities of Participation." *Governance* 20(2): 305-324.

Food and Water Watch. 2016. *The State of Public Water in the United States*.

Gerber, Elisabeth R. 1996. "Legislative Response to the Threat of Popular Initiatives." *American Journal of Political Science* 40(1): 99-128.

Gleick, Peter H. 1999. The Human Right to Water. *Water Policy* 1(5): 487-503.

Goodin, Robert E. 1992. *Green Political Theory*. Cambridge: Polity Press.

Gormley, William T. 1983. *The Politics of Public Utiltiy Regulation.* Pittsburgh: University of Pittsburgh Press.

Hanford, Priscilla L., and Alvin D. Sokolow. 1987. "Mandates as Both Hardship and Benefit: The Clean Water Program in Small Communities." *Publius* 17(4): 131-146.

Hardberger. Amy. 2005. "Life, Liberty, and the Pursuit of Water: Evaluating Water as a Human Right and the Duties and Obligations it Creates." *Northwestern Journal of International Human Rights* 4: 331-362.

Hird, John A., and Michael Reese. 1998. "The Distribution of Environmental Quality: An Empirical Analysis." *Social Science Quarterly* 79(4): 693-716.

Houston, David J. 2000. "Public-Service Motivation: A Multivariate Test." *Journal of Public Administration Research and Theory* 10(4): 713-728.

Howarth, David. 1999. "Privatization: A Help or Hindrance in Managing Water Demand." *Water Resources Update* 114: 18-25.

Jacobs, Jeffrey W., and Charles W. Howe. 2005. "Key Issues and Experience in US Water Service Privatization." *International Journal of Water Resources Development* 21(1): 89-98.

Kathi, Pradeep Chandra, and Terry L. Cooper. 2005. "Democratizing the Administrative State: Connecting Neighborhood Councils and City Agencies." *Public Administration Review* 65(5): 559-567.

Konisky, David, and Manuel P. Teodoro. 2016. "When Governments Regulate Government." *American Journal of Political Science* 60(3): 559-574.

Konisky, David M., and Christopher Reenock. 2013. "Compliance Bias and Environmental (In)Justice." *The Journal of Politics* 75(2): 506-519.

KSAT. 2016. "Crystal City Councilman Charged in Human Smuggling Case." *KSAT*. Available at: http://www.ksat.com/news/south-texas-city-councilman-charged-in-human-smuggling-case_ (Accessed: February 16, 2017).

Lachman, Ran. 1985. "Public and Private Sector Differences: CEO's Perceptions of their Role Environments" *The Academy of Management Journal* 28(3): 671-680.

Lan, Zhiyong, and Hal G. Rainey. 1992. "Goals, Rules, and Effectiveness in Public, Private, and Hybrid Organizations: More Evidence on Frequent Assertions about Differences." *Journal of Public Administration Research and Theory* 2(1): 5-28.

Leighley, Jan E., and Arnold Vedlitz. 1999. "Race, Ethnicity, and Political Participation: Competing Models and Explanations." *The Journal of Politics* 61(4): 1092-1114.

Levin, Ronnie B., Paul R. Epstein, Tim E. Ford, Winston Harrington, Erik Olson and Eric G. Reichard. 2002. "U.S. Drinking Water Challenges In the Twenty-First Century," *Environmental Health Perspectives* 100(1): 43-52.

Lindsay, Cotton M. 1976. "A Theory of Government Enterprise." *Journal of Political Economy* 84(5): 1061-1077.

Liu, Xinsheng, Arnold Vedlitz, and Liu Shi. 2014. "Examining the Determinants of Public Environmental Concern: Evidence from National Public Surveys." *Environmental Science and Policy* 39: 77-94

Locke, John. 1988. *Two Treatises of Government*. Cambridge: Cambridge University Press.

Meier, Kenneth J., and Laurence J. O'Toole. 2011. "Comparing Public and Private Management: Theoretical Expectations." *Journal of Public Administration Research and Theory* 21(3): 283-299.

Mill, John Stuart. 1991. *Considerations on Representative Government*. New York: Prometheus Books.

Mullin, Megan. 2008. "The Conditional Effect of Specialized Governance on Public Policy." *American Journal of Political Science* 52(1): 125-141.

National Research Council. 2002. *Privatization of Water Services in the United States: An Assessment of Issues and Experience*. Washington DC: National Academy Press.

Neshkova, Milena I., and Hai David Guo. 2011. "Public Participation and Organization Performance: Evidence from State Agencies." *Journal of Public Administration Review and Theory* 22(2): 267-288.

Putnam, Robert D., Robert Leonardi, and Raffaella Y. Nanetti. 1988. "Institutional Performance and Political Culture: Some Puzzles about the Power of the Past." *Governance* 1(3): 221-242.

Putnam, Robert D., Robert Leonardi, Raffaella Y. Nanetti, and Franco Pavoncello. 1983. "Explaining Institutional Success: The Case of Italian Regional Government." *The American Political Science Review* 77(1): 55-74.

Rainey, Hal G., and Barry Bozeman. 2000. "Comparing Public and Private Organizations: Empirical Research and the Power of the A Priori." *Journal of Public Administration Research and Theory* 10(2): 447-469.

Rainey, Hal G., Sanjay Pandey, and Barry Bozeman. "Research Note: Public and Private Managers' Perceptions of Red Tape." *Public Administration Review* 55(6): 567-574.

Rainey, Hal G., Robert W. Backoff and Charles H. Levine. 1976. "Comparing Public and Private Organizations." *Public Administration Review* 36(2): 233-244.

Renzetti, Steven, and Diane Dupont. 2003. "Ownership and Performance of Water Utilities." *Greener Management International* 42: 9-19.

Risse, Mathias. 2014. "The Human Right to Water and Common Ownership of the Earth." *Journal of Political Philosophy* 22(2): 178-203.

Roberts, Nancy. 2004. “Public Deliberation in an Age of Direct Citizen Participation.” *American Review of Public Administration* 34(4): 315-353.

Robinson, Joanna L. 2013. *Contested Water: The Struggle Against Water Privatization in the United States and Canada*. Cambridge: The MIT Press.

Saward, Michael. 1996. “Must Democrats be Environmentalists?.” In *Democracy & Green Political Thought: Sustainability, Rights, and Citizenship*. Editors Brian Doherty and Marius de Geus. London: Routledge: 79-95.

Schattschneider, E.E. 1960. *The Semi-Sovereign People.* New York: Holt, Rinehart, and Winston.

Scheberle, Denise. 2004. *Federalism and Environmental Policy*. Washington D.C.: Georgetown University Press.

Shapiro, Ian. 2002. “Problems, Methods, and Theories in the Study of Politics, or What’s Wrong with Political Science and What to Do about It.” *Political Theory* 30(4): 596-619.

Shapiro, Ian. 2016. *Politics Against Domination*. Cambridge: Harvard University Press.

Spicer, Ben. 2016. “Five Current, Former Crystal City Officials Arrested.” *KSAT*. Available at: http://www.ksat.com/news/fbi-multiple-agencies-make-arrests-in-law-enforcement-operation (Accessed: February 16, 2017).

Subramaniam, Mangala, and Beth Williford. “Contesting Water Rights: Collective Ownership and Struggles against Privatization.” *Sociology Compass* 6(5): 413-424.

Switzer, David, and Manuel P. Teodoro. Forthcoming. “Class, Race, Ethnicity, and Justice in Safe Drinking Water Compliance.” *Social Science Quarterly*.

Switzer, David, Manuel P. Teodoro, and Stuart Karasik. 2016. “The Human Capital Resource Challenge: Recognizing and Overcoming Small Utility Workforce Obstacles.” *Journal of the American Water Works Association* 108: E416-E424.

Taylor, Charles. 1967. “Neutrality in Political Science.” *Philosophy, Politics and Society* 3: 25-75.

Teodoro, Manuel P. 2005. “Measuring Fairness: Assessing the Equity of Municipal Water Rates.” *The Journal of the American Water Works Association* 97(4): 111-124.

Teodoro, Manuel P. 2010a. "Contingent Professionalism: Bureaucratic Mobility and the Adoption of Water Conservation Rates." *Journal of Public Administration Research and Theory* 20(2): 437-459.

Teodoro, Manuel P. 2010b. "The Institutional Politics of Water Conservation." *Journal of the American Water Works Association* 102(2): 98-111.

Teodoro, Manuel P. 2014. "When Professionals Lead: Executive Management, Normative Isomorphism, and Policy Implementation." *Journal of Public Administration Research and Theory* 24(4): 983-1004.

Teodoro, Manuel P., and David Switzer. 2016. "Drinking From the Talent Pool: A Resource Endowment Theory of Human Capital and Agency Performance." *Public Administration Review* 76(4): 564-575.

Tocqueville, Alexis de. 1835. *Democracy in America, Volume 1*. Chapter 5.

Vigoda, Eran. 2002. "From Responsiveness to Collaboration: Governance, Citizens, and the Next Generation of Public Administration." *Public Administration Review* 62(5): 527-540.

Wallsten, Scott, and Katrina Kosec. 2008. "The Effects of Ownership and Benchmark Competition: An Empirical Analysis of U.S. Water Systems," *International Journal of Industrial Organization* 62(1): 186-205.

Weiland, Paul S. "Environmental Regulations and Local Government Institutional Capacity." *Public Administration Quarterly* 22(2): 176-203.

Wiens, David. 2015. "Against Ideal Guidance." *The Journal of Politics* 77(2): 433-446.

Williams, Melina. 2007. "Privatization and the Human Right to Water: Challenges for the New Century." *Michigan Journal of International Law 28*: 469.

Willmott, Cort J., and Johannes J. Feddema. 1992. "A More Rational Climatic Moisture Index." *The Professional Geographer* 44(1): 84-88.

Wilson, James Q. 1989. *Bureaucracy: What Government Agencies Do and Why They Do It.* Basic Books.

Wilson, James Q. and Patricia Rachal. 1997. "Can the Government Regulate Itself?" *The Public Interest* 46(1): 3-14.

Winter, Soren, and Peter May. 2001. "Motivation for Compliance with Environmental Regulation." *Journal of Policy Analysis and Management* 20(4): 675-698.

APPENDIX

Logistic Regression of SDWA Compliance

Compliance is often modeled as a binary phenomenon. For this reason, I also ran the models using a logistic estimator. Compliance was coded as a 1 if the utility had no violations of given type in 2009 and 0 if it had one or more. The results can be seen in Tables A1-A3 and Figures A1 and A2. The results are substantively and statistically similar to those presented in the Chapter II.

Table A1: Logistic Regression Predicting Health Compliance

	(1)		(2)	
	Coefficient	p-value	Coefficient	p-value
Private	0.59	<.01	0.83	.37
	(0.22)		(0.92)	
Election Turnout	0.01	.03	0.01	.03
	(0.01)		(0.01)	
Private X Turnout			-0.00	.79
			(0.02)	
% Black	-0.00	.62	-0.00	.62
	(0.00)		(0.00)	
% Hispanic	0.00	.30	0.00	.31
	(0.00)		(0.00)	
% Below Poverty	-0.00	.61	-0.00	.61
	(0.01)		(0.01)	
Median Household Income	0.00	.63	0.00	.62
	(0.00)		(0.00)	
% w. Bachelor's Degree	-0.00	.54	-0.00	.54
	(0.01)		(0.01)	
Purchased Water	0.69	<.01	0.69	<.01
	(0.18)		(0.18)	
Ground Water	0.61	<.01	0.61	<.01
	(0.15)		(0.15)	
Population Served (Logged)	0.32	<.01	0.32	<.01
	(0.06)		(0.06)	
Constant	-1.98	.03	-1.99	.03
	(0.90)		(0.90)	
Observations	3451		3451	
AIC	2113.44		2115.36	
Log Likelihood	-1016.72		-1016.68	
LR-Test ($\chi 2$)	0.07			
Prob>$\chi 2$	.79			

Note: Standard Errors in parantheses. Models also include state fixed effects.
Likelihood Ratio Test of whether interactive model improves on no interaction model.

Table A2: Logistic Regression Predicting Management Compliance

	(1)		(2)	
	Coefficient	p-value	Coefficient	p-value
Private	0.38	.03	2.10	<.01
	(0.17)		(0.77)	
Election Turnout	0.15	<.01	0.02	<.01
	(0.01)		(0.01)	
Private X Turnout			-0.03	.02
			(0.01)	
% Black	-0.00	.21	-0.04	.19
	(0.00)		(0.00)	
% Hispanic	0.00	.44	0.00	.63
	(0.00)		(0.00)	
% Below Poverty	0.01	.17	0.01	.17
	(0.01)		(0.01)	
Median Household Income	0.00	.29	0.00	.27
	(0.00)		(0.00)	
% w. Bachelor's Degree	-0.00	.70	-0.00	.80
	(0.01)		(0.01)	
Purchased Water	-0.22	.12	-0.22	.12
	(0.14)		(0.14)	
Ground Water	0.29	.03	0.29	.03
	(0.13		(0.13	
Population Served (Logged)	0.35	<.01	0.35	<.01
	(0.06)		(0.06)	
Constant	-2.05	<.01	-2.11	<.01
	(0.77)		(0.78)	
Observations	3423		3423	
AIC	2723.18		2719.64	
Log Likelihood	-1323.59		-1320.82	
LR-Test ($\chi 2$)	5.53			
Prob>$\chi 2$	.02			

Note: Standard Errors in parantheses. Models also include state fixed effects.
Likelihood Ratio Test of whether interactive model improves on no interaction model.

Table A3: Marginal Effect of Turnout for Public and Private Utilities- Logit

	Health Model			Management Model		
	M.E.	Std. Error	p-value	M.E.	Std. Error	p-value
Public Utilities	0.001	(0.001)	0.031	0.002	(0.001)	.001
Private Utilities	0.001	(0.001)	0.544	-0.001	(0.001)	.335

Note: All other variables at means.

Figure A1. Marginal effect of privatization on health compliance.

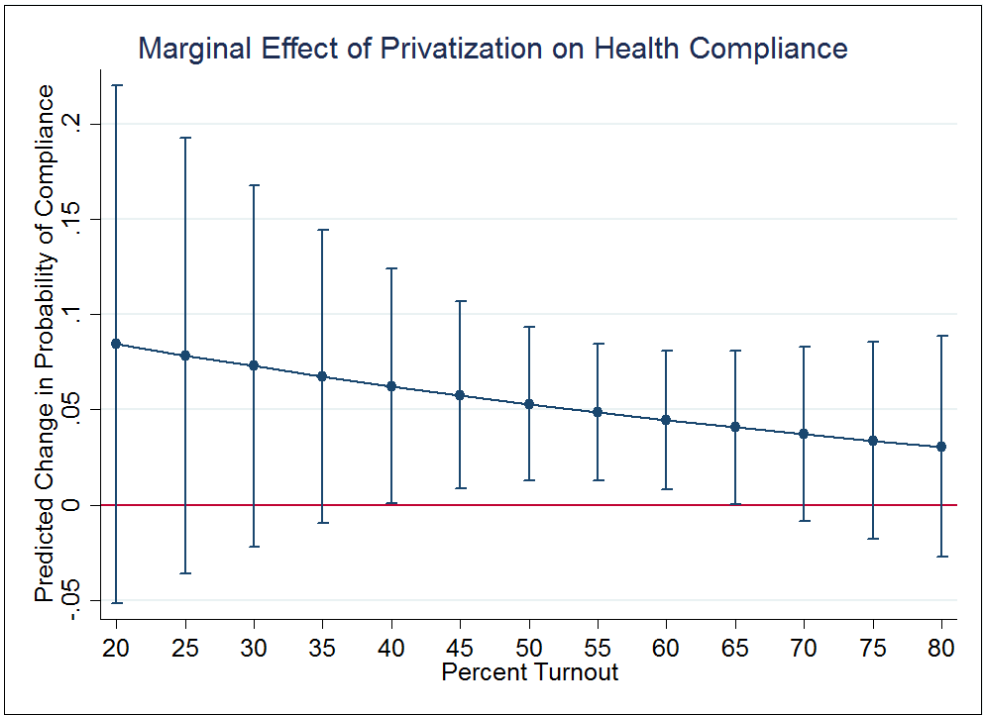
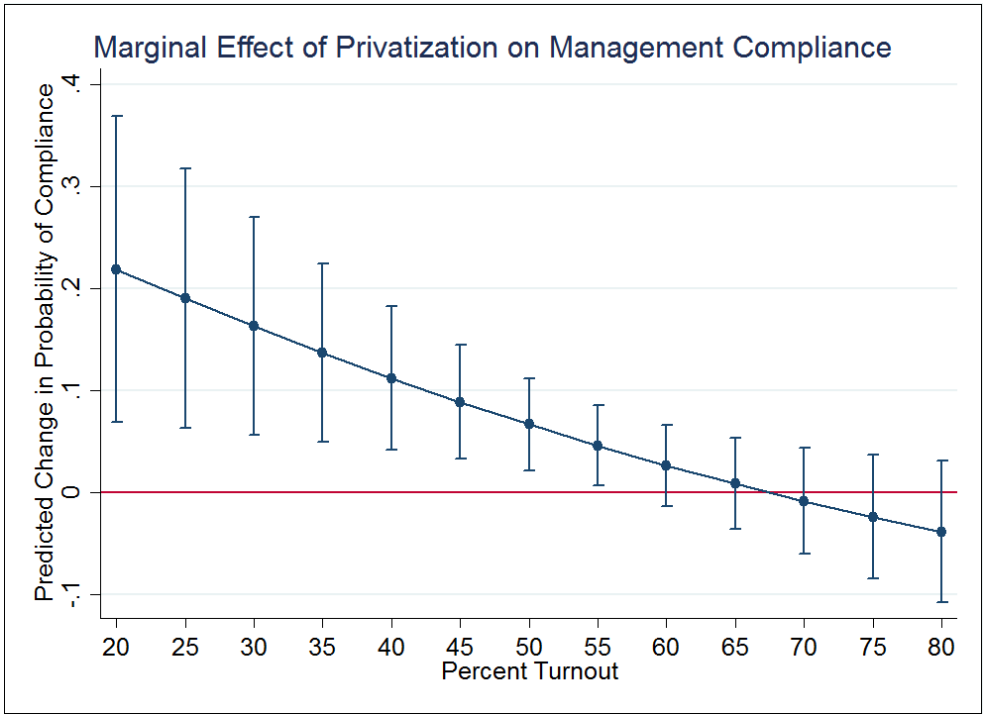


Figure A2. Marginal effect of privatization on management compliance.



Split Sample Estimates of SDWA Compliance

I also estimated the SDWA models as split samples instead of interactive models. The results were statistically and substantively similar to those of the interactive models. These results can be seen in Tables A4 and A5.

Table A4: Split Sample Models of Health Violations

	Public Utility Model			Private Utility Model		
	Coefficient	p-value	M.E.	Coefficient	p-value	M.E.
Election Turnout	-0.025	.004	-0.007	0.040	.364	+0.008
	(0.009)			(0.044)		
% Black	-0.004	.469	-0.001	0.018	.475	+0.004
	(0.005)			(0.025)		
% Hispanic	-0.011	.054	-0.003	-0.034	.293	-0.007
	(0.006)			(0.033)		
% Below Poverty	0.003	.772	0.001	0.016	.782	+0.003
	(0.012)			(0.057)		
Median Household Income	-0.009	.377	-0.000	-0.000	.646	-0.000
	(0.000)			(0.000)		
% w. Bachelor's Degree	0.009	.315	0.002	-0.008	.827	-0.002
	(0.009)			(0.036)		
Purchased Water	-0.637	.002	-0.177	-0.739	.489	-0.152
	(0.209)			(1.068)		
Ground Water	-0.405	.024	-0.112	0.245	.764	+0.050
	(0.179)			(0.815)		
Population Served (Logged)	-0.334	<.001	-0.093	-0.536	.115	-0.110
	(0.081)			(0.341)		
Constant	3.959	.001		0.009	.999	
	(1.170)			(5.060)		
Observations	2980			471		
Log Likelihood	-1444.817			-134.879		

Note: Standard Errors in parantheses. Models also include state fixed effects.
Marginal Effects Estimated with all other variables at means.

Table A5: Split Sample Models of Management Violations

	Public Utility Model			Private Utility Model		
	Coefficient	p-value	M.E.	Coefficient	p-value	M.E.
Election Turnout	-0.021	.001	-0.029	0.032	.227	+0.024
	(0.006)			(0.026)		
% Black	-0.000	.920	-0.001	0.007	.689	+0.005
	(0.004)			(0.017)		
% Hispanic	0.007	.079	+0.010	0.010	.501	+0.007
	(0.004)			(0.014)		
% Below Poverty	-0.001	.945	-0.001	-0.058	.191	-0.044
	(0.010)			(0.035)		
Median Household Income	-0.000	.036	-0.000	0.000	.917	+0.00
	(0.000)			(0.000)		
% w. Bachelor's Degree	0.007	.271	+0.010	-0.021	.345	-0.016
	(0.006)			(0.023)		
Purchased Water	-0.276	.088	-0.383	-0.136	.790	-0.103
	(0.162)			(0.511)		
Ground Water	-0.523	<.001	-0.727	-0.001	.998	-0.001
	(0.146)			(0.430)		
Population Served (Logged)	-0.362	<.001	-0.504	-0.172	.249	-0.130
	(0.062)			(0.149)		
Constant	3.367	<.001		-2.800		
	(0.867)			(2.988)		
Observations	2980			471		
Log Likelihood	-2464.104			-319.072		

Note: Standard Errors in parantheses. Models also include state fixed effects.
Marginal Effects Estimated with all other variables at means.

States in SDWA Analysis

Table A6 shows the states that were included in the analysis in Chapter III.

Table A6: States with Turnout Data

Alabama
Alaska
Arizona
California
Colorado
Delaware
Hawaii
Idaho
Illinois
Indiana
Iowa
Kansas
Louisiana
Michigan
Mississippi
Missouri
Nebraska
Nevada
New Hampshire
New Jersey
New Mexico
North Carolina
North Dakota
Oklahoma
Pennsylvania
Sout Dakota
Tennessee
Texas
Vermont
Wyoming

Sampling Methodology

The sampling frame for Chapter IV includes all municipal and private drinking water utilities serving more than 10,000 residents in the United States. This includes all municipal and private utilities classified as large or very large by the United States Environmental Protection Agency. Utility data were drawn from the Safe Drinking Water Information System (SDWIS). While utilities smaller than this make up a significant percentage of the total number of drinking water systems in the United States, they serve a small percentage of the total population. According to the SDWIS, approximately 80 percent of the United State population is served by utilities serving more than 10,000 residents. Additionally, rates information is not always readily available for smaller systems. Special districts, county systems, federally owned systems, and state owned systems were also excluded from the frame to allow for a direct comparison between municipal and private utilities.

As mentioned in the chapter, partisanship data was available at the local level for 37 states. The list of these states can be seen in Table A7. After removing the states without partisanship from the frame, 2,111 water utilities remained in the frame for sampling.

Once I established the frame, I used stratified sampling to draw representative data from utilities of differing sizes and ownership. It was important to stratify by size, since despite the majority of the utilities in the frame being those serving smaller populations, the majority of the United States population is served by larger utilities. Stratifying by size ensures their inclusion and allows the sample to more fully represent

the utilities that serve the United States population than a pure random sample. I used three strata for sampling based on utility size. The smallest stratum included was utilities serving 10,000 to 50,000 residents. The middle stratum included those utilities serving between 50,000 and 100,000 residents. The third stratum included those utilities serving 100,000 or more residents.

Table A7: States with Partisanship Data

Alabama
Alaska
Arizona
California
Colorado
Connecticut
Delaware
Hawaii
Idaho
Illinois
Indiana
Iowa
Kansas
Louisiana
Maryland
Massachusetts
Michigan
Minnesota
Mississippi
Missouri
Nebraska
Nevada
New Hampshire
New Jersey
New Mexico
New York
North Carolina
North Dakota
Ohio
Oklahoma
Pennsylvania
South Carolina
South Dakota
Tennessee
Texas
Vermont
Wyoming

Additionally, I stratified for ownership. Since the primary concern is the difference between private and public utilities, it was important to ensure that enough variation in ownership was included in the sample. Since only 13 percent of the utilities in the frame are private, stratifying the sample was a way of ensuring that an adequate number of private utilities were included in the sample.

In total, given the stratification on size and ownership, I was left with six strata, three each for each type of ownership, separated by size. I took a random sample of utilities for each of the strata, going to the utility website to collect rates data. For each of the private strata, I collected 20 utilities worth of rates data. For each of the public utility strata, I collected 50 utilities worth of rates data. This procedure led to the final sample of 210, which is about a tenth of the total frame population. I used the proportion of each strata's observations in the sample and frame to determine the post-stratification weights applied to observations in each strata. This information can be seen in Table A8. Finally, the probability weights were factored into the statistical analysis in order to correct for the bias that would occur from the nonrandom nature of the stratification.

Table A8: Population and Sample Weights

Strata	Ownership	Utility Population	Frame N	Sample N	% of Frame	% of Sample	Weight
1	Private	>100K	43	20	2.03	9.52	0.21
2	Private	50K-100K	40	20	1.89	9.52	0.20
3	Private	10K-50K	193	20	9.14	9.52	0.96
4	Public	>100K	184	50	8.72	23.81	0.37
5	Public	50K-100K	248	50	11.75	23.81	0.49
6	Public	10K-50K	1403	50	66.46	23.81	2.79
			2111	210	100	100	

Note: Totals do not add up to 100 due to rounding.